*Motherboards*

# MXGA Series

## ATX Motherboard with 6 PCI Slots, 1 PCIe Slot, VGA, Audio, SATA, USB, and CompactFlash

RoHS compliant

# USER'S MANUAL

**VER. 1.0C • OCT 2008**

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| MXGA Series | | |
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| 1.0C | Initial Release | October 18, 2008 |


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# Packing List

**NOTE:**

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact CyberResearch, Inc. via phone:(203) 643-5000, email: sales@cyberresearch.com or via our website: www.cyberresearch.com.

The items listed below should all be included in the MXGA motherboard package.

- 1 x MXGA Single Board Computer
- 1 x IDE Cable
- 2 x Dual RS-232 Cable
- 2 x SATA Cable
- 1 x SATA Power Cable
- 1 x I/O Shielding
- 1 x Mini Jumper Pack
- 1 x Utility CD

Images of the above items are shown in **Chapter 3**.


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# Glossary

| | |
|---|---|
| AC'97 | Audio Codec 97 |
| ACPI | Advanced Configuration and Power Interface |
| APM | Advanced Power Management |
| ARMD | ATAPI Removable Media Device |
| ASKIR | Shift Keyed Infrared |
| ATA | Advanced Technology Attachments |
| BIOS | Basic Input/Output System |
| CFII | Compact Flash Type 2 |
| CMOS | Complementary Metal Oxide Semiconductor |
| CPU | Central Processing Unit |
| Codec | Compressor/Decompressor |
| COM | Serial Port |
| DAC | Digital to Analog Converter |
| DDR | Double Data Rate |
| DIMM | Dual Inline Memory Module |
| DIO | Digital Input/Output |
| DMA | Direct Memory Access |
| EIDE | Enhanced IDE |
| EIST | Enhanced Intel SpeedStep Technology |
| FDD | Floppy Disk Drive |
| FDC | Floppy Disk Connector |
| FFIO | Flexible File Input/Output |
| FIFO | First In/First Out |
| FSB | Front Side Bus |
| IrDA | Infrared Data Association |
| HDD | Hard Disk Drive |
| IDE | Integrated Data Electronics |
| I/O | Input/Output |
| ICH4 | I/O Controller Hub 4 |
| L1 Cache | Level 1 Cache |
| L2 Cache | Level 2 Cache |
| LCD | Liquid Crystal Display |
| LPT | Parallel Port Connector |
| LVDS | Low Voltage Differential Signaling |
| MAC | Media Access Controller |
| OS | Operating System |
| PCI | Peripheral Connect Interface |
| PIO | Programmed Input Output |
| PnP | Plug and Play |
| POST | Power On Self Test |
| RAM | Random Access Memory |
| SATA | Serial ATA |
| S.M.A.R.T | Self Monitoring Analysis and Reporting Technology |
| SPD | Serial Presence Detect |
| S/PDI | Sony/Philips Digital Interface |
| SDRAM | Synchronous Dynamic Random Access Memory |
| SIR | Serial Infrared |
| UART | Universal Asynchronous Receiver-transmitter |
| USB | Universal Serial Bus |
| VGA | Video Graphics Adapter |


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Chapter

1

# Introduction

## 1.1 MXGA Overview

The MXGA motherboard is an LGA775 Intel® Core™ 2 Duo/Intel® Pentium® 4/Intel® Pentium® D/Intel® Celeron® D CPU platform with an Intel® 945G Express Chipset and Intel® I/O Controller Hub 7 (ICH7) Southbridge. The MXGA has a maximum front side bus (FSB) frequency of 1066MHz, supports up to 8GB of dual channel 677MHz DDR2 RAM and comes with VGA, PS/2 keyboard/mouse, COM port, serial port and audio interfaces as well as a dual Broadcom PCI Express Gigabit Ethernet (GbE). The MXGA supports up to four serial ATA (SATA 3Gb/s) hard disk drives and up to eight USB 2.0 devices. If RAID support for the system is required, contact CyberResearch, Inc. via phone: 203) 643-5000 or email: sales@cyberresearch.com

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### 1.1.1 MXGA Features

Some of the MXGA features are listed below.

- RoHS compliant
- Support for the following CPUs:
  - LGA775 Intel® Core™ 2 Duo
  - LGA775 Intel® Pentium® 4
  - LGA775 Intel® Pentium® D
  - LGA775 Intel® Celeron® D
- Integrated Intel® GMA950 graphics engine
- Maximum FSB of 1066MHz
- Four 240-pin dual channel 400/533/677MHz DDR2 SDRAM DIMMs support up to 8GB of memory
- High performance PCIe Gigabit Ethernet chipset (LAN1 with ASF2.0 remote control support)
- Four SATA 3Gb/s drives supported
- Two Ultra ATA 100, Ultra ATA 66 or Ultra ATA 33 IDE HDDs supported
- Eight USB 2.0 devices supported
- ATX power only
- 5.1 channel surround sound supported
- TPM V1.2 hardware security function supported
- PCI expansion:
  - 1 x PCI Express x16 expansion slot
    (Supports PCIe x1/2/4/8/16 PCI-E add on cards)
  - 6 x PCI expansion slots

# 1.2 MXGA Overview

## 1.2.1 MXGA Overview Photo

The MXGA has a wide variety of internal and external peripheral connectors. The peripheral connectors are connected to devices including storage devices, display devices and parallel communications devices. A labeled photo of the peripheral connectors is shown in Figure 1-1.

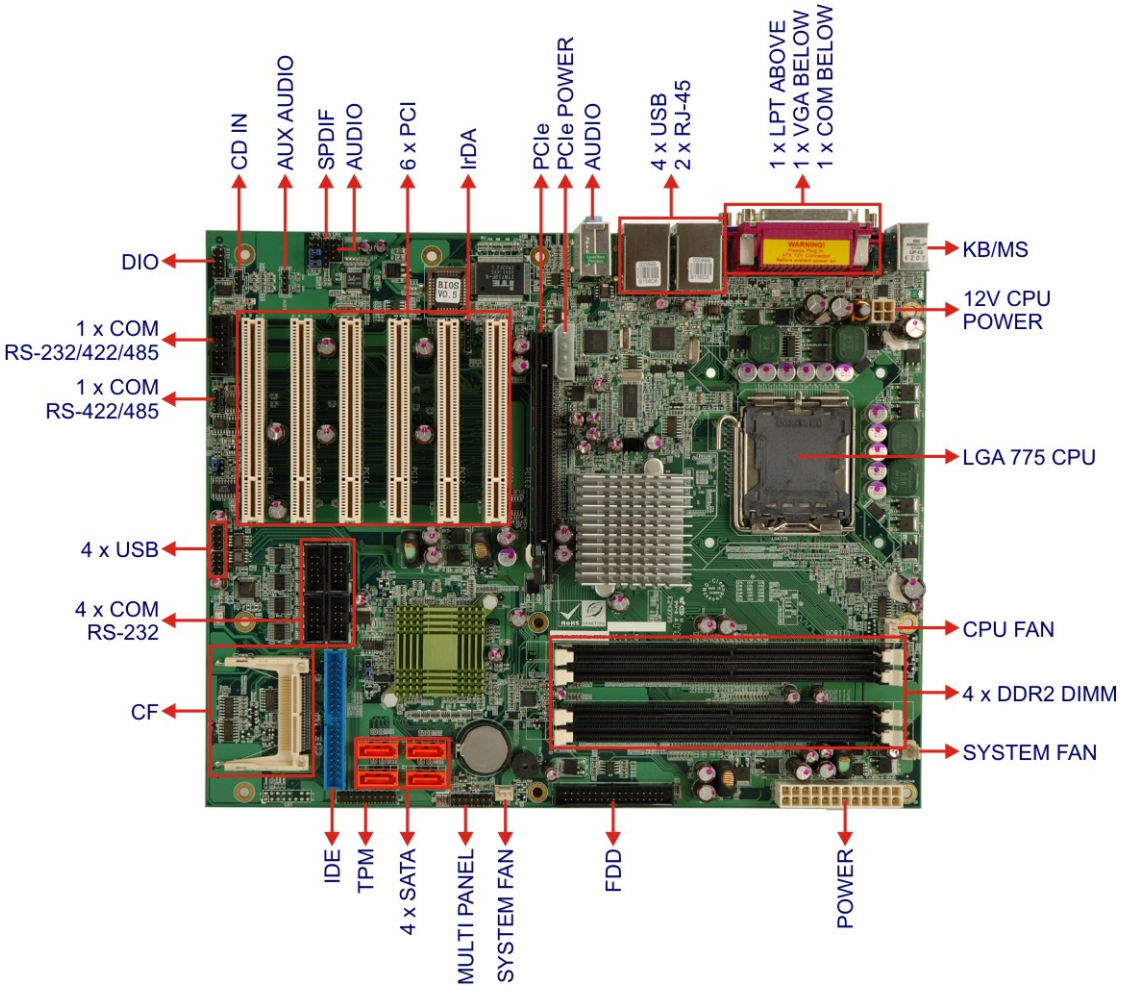


**Figure 1-1: MXGA Overview**


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### 1.2.2 MXGA Peripheral Connectors and Jumpers

The MXGA has the following on-board connectors:

- 1 x 12V power connector
- 1 x ATX power connector
- 1 x Audio connector
- 1 x Aux. Audio connector
- 1 x CD-in connector
- 1 x CompactFlash slot
- 4 x DDR2 DIMM slots
- 1 x DIO connector
- 3 x Fan connectors
- 1 x Floppy disk connector
- 1 x Front panel connector
- 1 x IDE disk drive connector
- 1 x Infrared interface connector
- 1 x Multi panel connector
- 1 x PCIe slot
- 6 x PCI slots
- 4 x Serial ATA (SATA) drive connectors
- 6 x Serial port connectors
- 1 x SPDIF connector
- 1 x TPM connector
- 2 x USB connectors

The MXGA has the following external peripheral interface connectors on the board rear panel:

- 1 x PS/2 dual keyboard/mouse connector
- 1 x parallel port connector
- 1 x serial port connector
- 1 x VGA connector
- 2 x Ethernet connectors
- 4 x USB connectors
- 3 x audio connectors

The MXGA has the following on-board jumpers:

- CF Master/Slave Selection
- Clear CMOS
- COM2 RS-232/422/485 Selection

### 1.2.3 Technical Specifications

MXGA technical specifications are listed in Table 1-1. Detailed descriptions of each specification can be found in Chapter 2.

| Specification | MXGA |
|---|---|
| **Form Factor** | **ATX motherboard** |
| **System CPU** | **LGA775 Intel® Core™ 2 Duo (up to 2.66GHz)**<br>**LGA775 Intel® Pentium® 4 (up to 3.8GHz)**<br>**LGA775 Intel® Pentium® D (up to 3.6GHz)**<br>**LGA775 Intel® Celeron® D (up to 3.6GHz)**<br>**(Hyperthreading Technology supported)** |
| **Front Side Bus** | **533MHz, 800MHz or 1066MHz** |
| **System Chipset** | **Northbridge: Intel® 945G Express**<br>**Southbridge: Intel® ICH7** |
| **Memory** | **Four 240-pin DDR2 DIMM slots support four 2GB,**<br>**400MHz, 533MHz or 667MHz DDR2 SDRAM DIMMs** |
| **Display** | **CRT: Intel® Graphics Media Accelerator (GMA) 950**<br>**integrated with DB-15 VGA connector** |
| **BIOS** | **AMI BIOS** |
| **Audio** | **5.1 channel audio via pin header** |
| **LAN** | **Broadcom BCM5787 PCI Express Gigabit Ethernet controller** |


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| Specification | MXGA |
|---|---|
| COM | Six on-board serial ports:<br>Four on-board RS-232 serial ports<br>One on-board RS-232/422/485 serial port (by jumper setting)<br>One on-board RS-422/485 serial port (by jumper setting) |
| USB 2.0 | Eight USB 2.0 devices supported |
| IDE | One 40-pin IDE connects up to two Ultra ATA33/66/100 devices |
| Floppy Disk | One FDD connector supports one floppy disk drive |
| SATA | Four SATA 3Gb/s drives supported |
| Keyboard/mouse | One PS/2 connector supports mouse and keyboard connectivity |
| Watchdog Timer | Software programmable 1-255 sec. by supper I/O |
| Power Supply | +12V@10.17A, +5V@4.25A, 3.3V@6.07A<br>(Pentium 4 3.73GHz, 1066MHz CPU with 1GB DDR2-667MHz) |
| Temperature | 0ºC ~ 60ºC (32ºF ~140ºF) |
| Humidity (operating) | 5%~95% non-condensing |
| Dimensions | 305mm x 244mm |
| Weight (GW/NW) | 1.2kg/0.65kg |

**Table 1-1: Technical Specifications**

Chapter

2

# Detailed Specifications


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# 2.1 Overview

This chapter describes the specifications and on-board features of the MXGA in detail.

# 2.2 Dimensions

## 2.2.1 Board Dimensions

The dimensions of the board are listed below and shown in Figure 2-1.

- **Length**: 305 mm
- **Width**: 244 mm

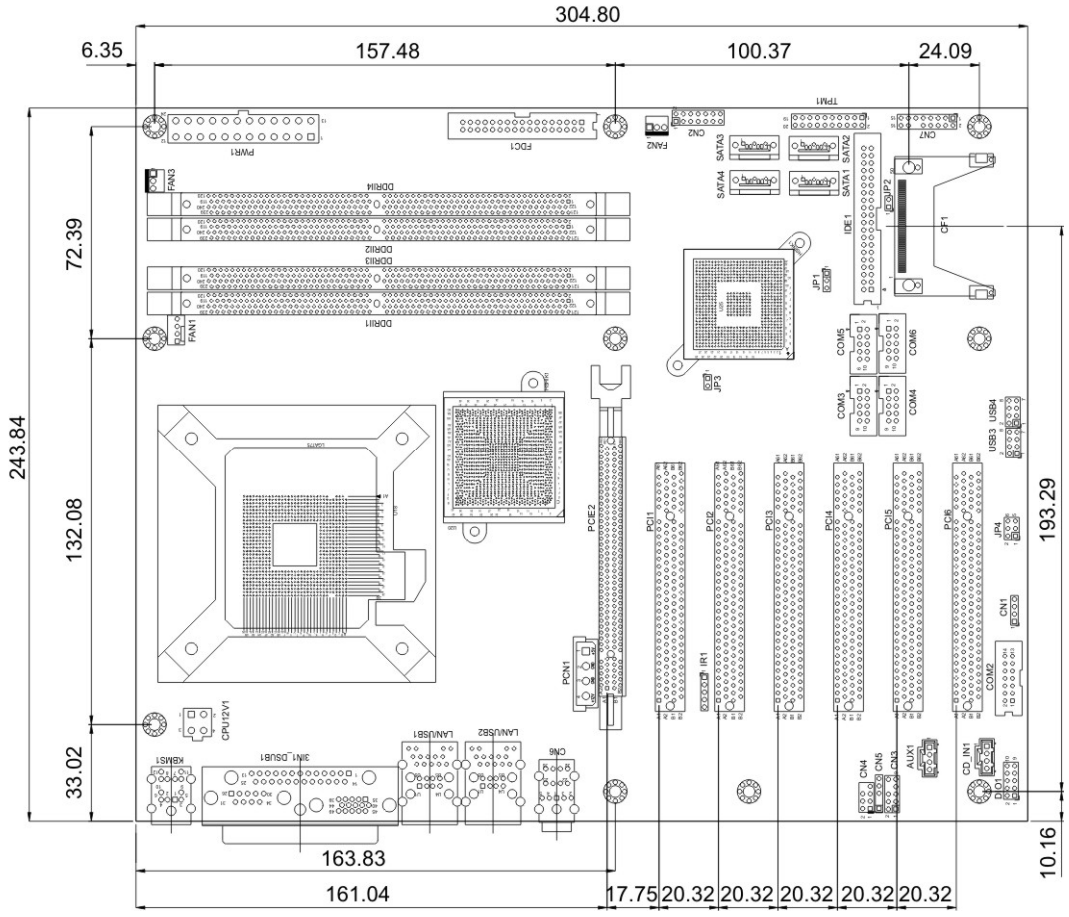


**Figure 2-1: MXGA Dimensions (mm)**


25 Business Park Drive
Branford, CT USA
P: (203) 643-5000; F: (203) 643-5001
www.cyberresearch.com

## 2.2.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in Figure 2-2.

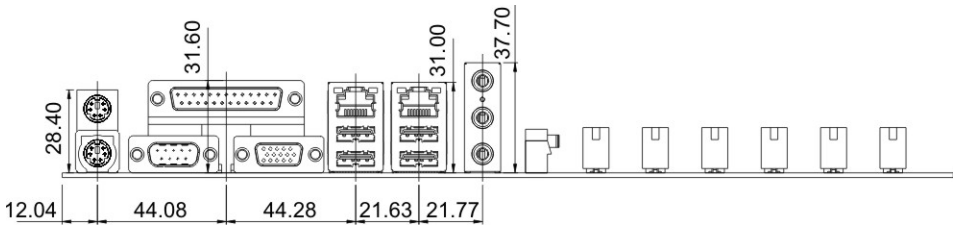


**Figure 2-2: External Interface Panel Dimensions (mm)**


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## 2.3 Data Flow

Figure 2-3 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.

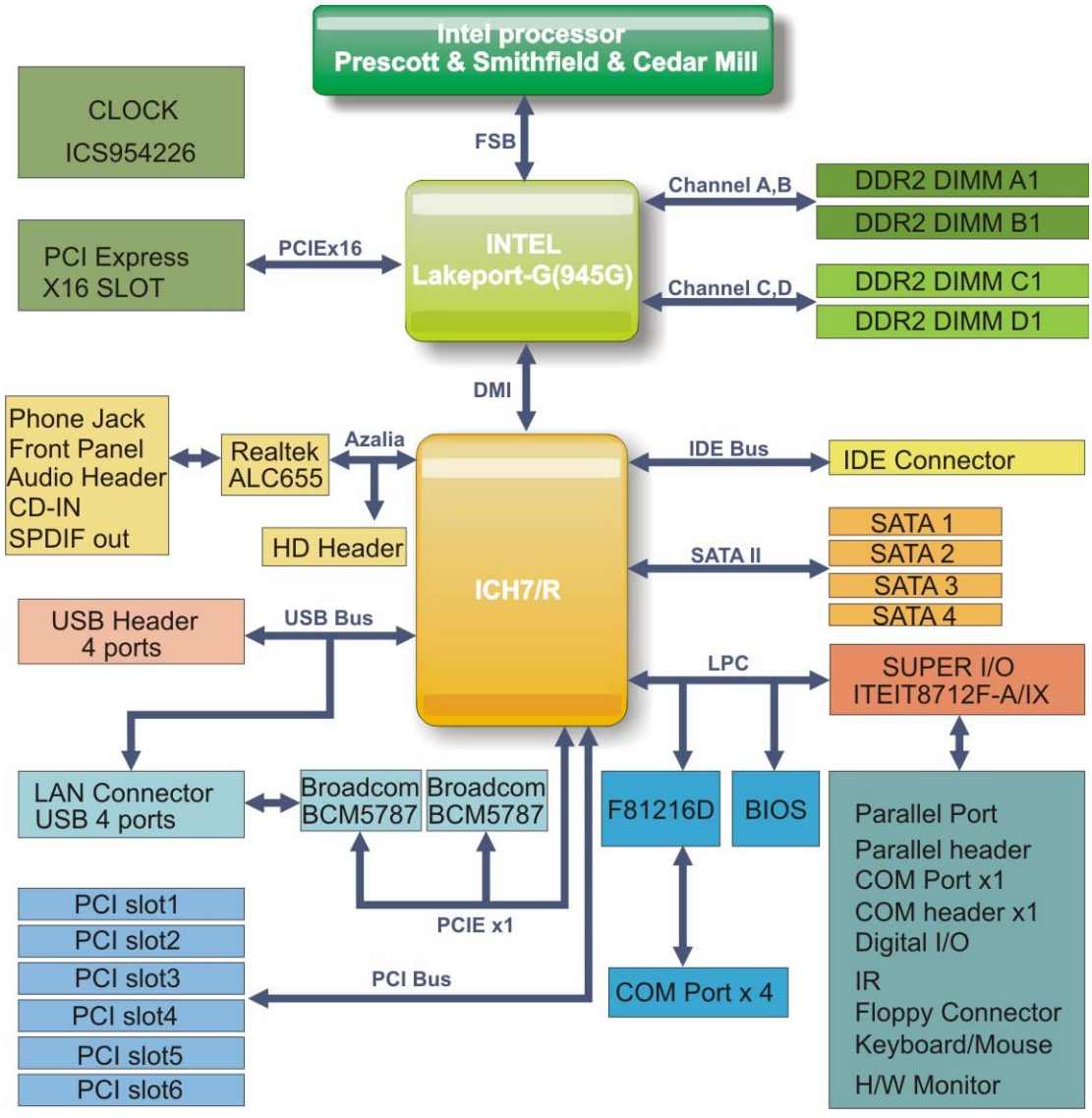


**Figure 2-3: Data Flow Block Diagram**

# 2.4 Compatible Processors

## 2.4.1 CPU Overview

LGA775 Intel® Core™ 2 Duo, Intel® Pentium® 4, Intel® Pentium® D and Intel® Celeron® D processors can be installed on the MXGA motherboard. The Intel® Pentium® 4 processors and the Intel® Celeron® D processors all have Intel® Extended Memory 64 Technology (Intel® EMT64T)

## 2.4.2 Supported Intel® Core™ 2 Duo Processors

Specifications for the compatible Intel® Core™ 2 Duo processors are listed in Table 2-1.

| CPU Speed | Bus Speed | Mfg. Tech | Cache | Package | Processor No. |
|---|---|---|---|---|---|
| 2.66 GHz | 1066 MHz | 65 nm | 4 MB | LGA775 | E6700 |
| 2.40 GHz | 1066 MHz | 65 nm | 4 MB | LGA775 | E6600 |
| 2.13 GHz | 1066 MHz | 65 nm | 2 MB | LGA775 | E6400 |
| 1.86 GHz | 1066 MHz | 65 nm | 2 MB | LGA775 | E6300 |
| 1.80 GHz | 800 MHz | 65 nm | 2 MB | LGA775 | E4300 |

**Table 2-1: Supported Intel® Core™ 2 Duo Processors**

## 2.4.3 Supported Intel® Pentium® 4 Processors

Specifications for the compatible Intel® Pentium® 4 processors are listed in Table 2-2.

| CPU Speed | Bus Speed | Mfg. Tech | Cache | Package | Processor No. |
|---|---|---|---|---|---|
| 3.80 GHz | 800 MHz | 90 nm | 2 MB | LGA775 | 672 |
| 3.80 GHz | 800 MHz | 90 nm | 1 MB | LGA775 | 570J |
| 3.80 GHz | 800 MHz | 90 nm | 1 MB | LGA775 | 571 |

**Table 2-2: Supported Intel® Pentium® 4 Processors**


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### 2.4.5 Supported Intel® Pentium® D Processors

Specifications for the compatible Intel® Pentium® D processors are listed in Table 2-3.

| CPU Speed | Bus Speed | Mfg. Tech | Cache | Package | Processor No. |
|---|---|---|---|---|---|
| 3.60 GHz | 800 MHz | 65 nm | 4 MB | LGA775 | 960 |
| 3.40 GHz | 800 MHz | 65 nm | 4 MB | LGA775 | 950 |
| 3.40 GHz | 800 MHz | 65 nm | 4 MB | LGA775 | 945 |

**Table 2-3: Supported Intel® Pentium® D Processors**

### 2.4.6 Supported Intel® Celeron® D Processors

Specifications for the compatible Intel® Celeron® D processors are listed in Table 2-4 below:

| CPU Speed | Bus Speed | Mfg. Tech | Cache | Package | Processor No. |
|---|---|---|---|---|---|
| 3.60 GHz | 533 MHz | 65 nm | 512 KB | LGA775 | 365 |
| 3.46 GHz | 533 MHz | 65 nm | 512 KB | LGA775 | 360 |
| 3.33 GHz | 533 MHz | 65 nm | 512 KB | LGA775 | 356 |

**Table 2-4: Supported Intel® Celeron® D Processors**

## 2.5 Intel® 945G Northbridge Chipset

### 2.5.1 Intel® 945G Overview

The Intel® 945G northbridge chipset consists of a graphics and memory controller hub (GMCH). The GMCH on the Intel® 945G is interfaced to the Intel® I/O Controller Hub 7 (ICH7) through a high speed Direct Media Interface (DMI) chip-to-chip connection. The high-speed DMI integrates priority based servicing that allows for concurrent traffic and true isochronous transfer capabilities. Some of the features of the Intel® 945G are listed below.


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- Support 533/800/1066MHz FSB
- Supports four, 1GB, 400/533/667MHz dual channel DDR SDRAM DIMMs
- Integrated VGA and SDVO (Serial Digital Video Output) outputs
- Integrated Intel® Graphics Media Accelerator 950 (Intel® GMA 950)
- 2.0GB/s concurrent DMI bandwidth maximizes chipset communications
- PCI Express x16 Graphics Interface with a raw bit rate on data pins of 2Gb/s
- Integrated Intel® High Definition Audio
- Integrated Intel® Matrix Storage Technology
- Integrated Intel® Active Management Technology
- Integrated Intel® Flex Memory Technology

### 2.5.2 Intel® 945G Memory Support

The Intel® 945G supports four, 2GB, 400/533/667MHz dual channel DDR SDRAM DIMMs. Four 240-pin memory sockets on the MXGA enable a maximum of 8GB of memory to be installed on the system. The memory sockets are shown in Figure 2-4.

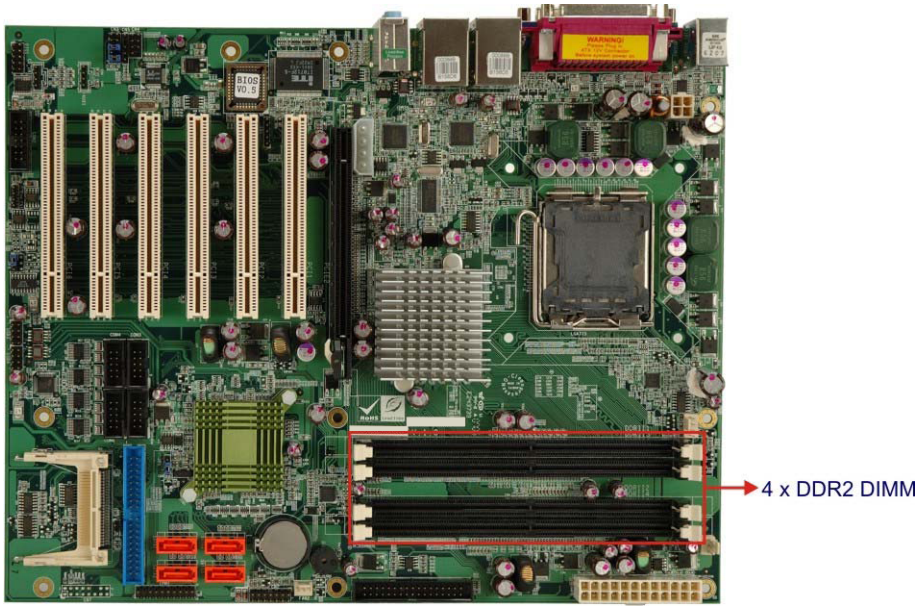


**Figure 2-4: 240-pin DIMM Sockets**

### 2.5.3 Intel® 945G Serial Digital Video Output (SDVO)

Some of the features of the SDVO ports are listed below.

- Two SDVO ports multiplexed with PCI Express graphics interface
- 200 MHz dot clock on each 12-bit interface
- Can combine two channels to form one larger interface
- Flat panels up to 2048x1536 @ 60 Hz or
  digital CRT/HDTV at 1920x1080 @ 85Hz
- Dual independent display options with digital display
- Multiplexed digital display channels (Supported with ADD2 Card).
- Supports TMDS transmitters or TV-Out encoders
- ADD2/ADD2+ card uses PCI Express graphics x16 connector

### 2.5.4 Intel® 945G Integrated Graphics Media Accelerator 950

The Intel® 945G has the Intel® GMA 950 integrated into the chipset. Some of the features of the GMA 950 are listed below.

- Intel GMA 950 Graphics Core
  - 400MHz 256-bit graphics core
  - Up to 10.6 GB/sec memory bandwidth with DDR2 667 MHz system memory
  - 1.6 GPixels/sec and 1.6 GTexels/sec fill rate
  - 192 MB maximum video memory
  - 2048x1536 at 75 Hz maximum resolution
  - Dynamic Display Modes for flat-panel, wide-screen and Digital TV support
  - Operating systems supported: Microsoft Windows* XP, Windows* XP 64-bit, Media Center Edition, Windows 2000; Linux-compatible (Xfree86 source available)
- High Performance 3D
  - Up to 4 pixels per clock rendering
  - Microsoft* DirectX* 9 Hardware Acceleration Features: Pixel Shader 2, Volumetric Textures, Shadow Maps, Slope Scale Depth Bias, Two-Sided Stencil
  - Microsoft* DirectX* 9 Vertex Shader 3.0 and Transform and Lighting supported in SW through highly optimized Processor Specific Geometry Pipeline (PSGP)
  - Texture Decompression for DirectX* and OpenGL*

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- OpenGL* 1.4 support with ARB extensions

- Advanced Display Technology
  - Consumer Electronic display (Digital TV) support
  - Two Serial Digital Video Out (SDVO) ports for flat-panel monitors and/or TV-out support via ADD2 cards
  - Support for Intel Media Expansion Cards, providing TV out and PVR capability
  - Multiple display types (LVDS, DVI-I, DVI-D, HDTV, TV-out, CRT)
  - Dual screen support via ADD2 digital video devices
  - HDTV 720p and 1080i display resolution support
  - Interlaced Display output support
- High Quality Media Support
  - High Definition Hardware Motion Compensation to support HD hi-bitrate MPEG2 media playback
  - Up and Down Scaling of Video Content
  - HD Content Decode – up to two stream support
  - 5x3 Overlay Filtering

# 2.6 Intel® ICH7 Southbridge Chipset

## 2.6.1 Intel® ICH7 Overview

The ICH7 southbridge chipset on the MXGA has the features are listed below.

- Complies with PCI Express Base Specification, Revision 1.0a
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
  - Enhanced DMA controller
  - Interrupt controller
  - Timer functions
- Integrated SATA host controller with DMA operations on four ports with data transfer rates up to 3.0 Gb/s
- Integrated IDE controller supports Ultra ATA 100/66/33
- Supports eight USB 2.0 devices with four UHCI controllers and one EHCI

controller

- Complies with System Management Bus (SMBus) Specification, Version 2.0
- Supports Audio Codec ’97 (AC’97) Revision 2.3
- Supports Intel® High Definition Audio
- Contains Low Pin Count (LPC) interface
- Supports Firmware Hub (FWH) interface
- Serial Peripheral Interface (SPI) for Serial and Shared Flash
- 1.05 V Core Voltage
- Intel® High Definition Audio Interface
- Intel® Active Management Technology
- Intel® Quick Resume Technology Support

### 2.6.2 Intel® ICH7 Audio Codec ’97 Controller

The Audio Codec ’97 (AC’97) controller integrated into the ICH7 complies with AC’97 Component Specification, Version 2.3. The AC’97 controller is connected to the onboard audio connector. The audio connector is connected to an optional 5.1 channel or 7.1 channel audio kit with an embedded AC’97 audio codec. The AC’97 controller supports up to six PCM audio output channels. Complete surround sound requires six-channel audio consisting of:

- Front left
- Front right
- Back left
- Back right
- Center
- Subwoofer

### 2.6.3 Intel® ICH7 IDE Interface

The integrated IDE interface on the ICH7 southbridge supports two IDE hard disks and ATAPI devices, PIO IDE transfers up to 16MB/s and Ultra ATA transfers of 100MB/s. The integrated IDE interface is able to support the following IDE HDDs:

- **Ultra ATA/100**, with data transfer rates up to 100MB/s
- **Ultra ATA/66**, with data transfer rates up to 66MB/s

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- **Ultra ATA/33**, with data transfer rates up to 33MB/s

Table 2-5 shows the supported HDD specifications.

| Specification | Ultra ATA/100 | Ultra ATA/66 | Ultra ATA/33 |
|---|---|---|---|
| **IDE devices** | **2** | **2** | **2** |
| **PIO Mode** | **0 – 4** | **0 – 4** | **0 – 4** |
| **PIO Max Transfer Rate** | **16.6 MB/s** | **16.6 MB/s** | **16.6 MB/s** |
| **DMA/UDMA designation** | **UDMA 3 - 4** | **UDMA 3 – 4** | **UDMA 2** |
| **DMA/UDMA Max Transfer** | **100MB/s** | **66MB/s** | **33MB/s** |
| **Controller Interface** | **5V** | **5V** | **5V** |

**Table 2-5: Supported HDD Specifications**

### 2.6.4 Intel® ICH7 Low Pin Count (LPC) Interface

The ICH7 LPC interface complies with the LPC 1.1 specifications. The LPC bus from the ICH7 is connected to the following components:

- BIOS chipset
- Super I/O chipset

### 2.6.5 Intel® ICH7 PCI Interface

The PCI interface on the ICH7 is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI Revision 2.3 compliant
- 33MHz
- 5V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to seven PCI bus masters

Three of the seven PCI bus masters are interfaces to the following onboard components:

- PCI slot connector on the bottom of the motherboard
- Broadcom PCI Express GbE interface

- ITE PCI-to-ISA bridge interface

The remaining four PCI bus masters are reserved for four PCI expansion boards that can be installed on the backplane.

### 2.6.6 Intel® ICH7 Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818A real time clock (RTC) integrated into the ICH7. The RTC operates on a 3V battery and 32.768KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

### 2.6.7 Intel® ICH7 SATA Controller

The integrated SATA controller on the ICH7 southbridge supports four SATA drives with independent DMA operations. SATA controller specifications are listed below.

- Supports four SATA drives
- Supports 3.0Gb/s data transfer speeds
- Supports Serial ATA Specification, Revision 1.0a and supports several optional sections of the Serial ATA II: Extensions to Serial ATA 1.0 Specification, Revision 1.0 (AHCI support is required for some elements).

### 2.6.8 Intel® ICH7 USB Controller

Up to eight high-speed, full-speed or low-speed USB devices are supported by the ICH7. High-speed USB 2.0, with data transfers of up to 480MB/s, is enabled with the ICH7 integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the four ICH7 integrated Universal Host Controller Interface (UHCI) controller.

## 2.7 PCI Bus Components

### 2.7.1 PCI Bus Overview

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The PCI bus controller on the ICH7 southbridge is compliant with PCI Revision 2.3 specifications and has a 33MHz PCI clock. The components listed below are all connected to the PCI bus:

- PCI Express and PCI slots on the motherboard
- Broadcom PCI Express GbE interface

### 2.7.2 Broadcom PCIe GbE interface

The BCM5787M Broadcom PCIe GbE controller is a 10/100/1000BASE-T Ethernet LAN controller. The BCM5787M combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, a PCIe bus interface, and an on-chip buffer memory. Some of the BCM5787 controller features are listed below:

- Integrated 10/100/1000BASE-T transceiver
- Automatic MDI crossover function
- PCIe v1.0a
- 10/100/1000BASE-T full/half-duplex MAC
- Wake on LAN support meeting the ACPI requirements
- Statistics for SNMP MIB II, Ethernet-like MIB, and Ethernet MIB (802.3z, clause 30)
- Serial EEPROM or serial flash support
- JTAG support

## 2.8 LPC Bus Components

### 2.8.1 LPC Bus Overview

The LPC bus is connected to components listed below:

- BIOS chipset
- Super I/O chipset

### 2.8.2 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support

### 2.8.3 Super I/O chipset

The iTE IT8712F Super I/O chipset is connected to the ICH6 southbridge through the LPC bus. The iTE IT8712F is an LPC interface-based Super I/O device that comes with Environment Controller integration. Some of the features of the iTE IT8712F chipset are listed below:

- LPC Interface
- PC98/99/2001, ACPI and LANDesk Compliant
- Enhanced Hardware Monitor
- Fan Speed Controller
- SmartGuardian Controller
- Single +5V Power Supply
- Two 16C550 UARTs for serial port control
- One IEEE 1284 Parallel Port
- Floppy Disk Controller
- Keyboard Controller
- Watchdog Timer
- Serial IRQ Support
- Vbat & Vcch Support
- Single +5V Power Supply

Some of the Super I/O features are described in more detail below:

#### 2.8.3.1 Super I/O LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.0. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

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### 2.8.3.2 Super I/O 16C550 UARTs

The onboard Super I/O has two integrated 16C550 UARTs that can support the following:

- Two standard serial ports (COM1 and COM2)
- IrDa 1.0 and ASKIR protocols

Another two chipsets connected to the LPC bus provided connectivity to another two serial port connectors (COM3 and COM4).

### 2.8.3.3 Super I/O Enhanced Hardware Monitor

The Super I/O Enhanced Hardware Monitor monitors three thermal inputs, VBAT internally, and eight voltage monitor inputs. These hardware parameters are reported in the BIOS and can be read from the BIOS Hardware Health Configuration menu.

### 2.8.3.4 Super I/O Fan Speed Controller

The Super I/O fan speed controller enables the system to monitor the speed of the fan. One of the pins on the fan connector is reserved for fan speed detection and interfaced to the fan speed controller on the Super I/O. The fan speed is then reported in the BIOS.

### 2.8.3.5 Super I/O Parallel Port

The Super I/O parallel port (LPT) supports standard mode, enhanced mode and high-speed mode parallel port devices. The LPT is compliant with the following LPT modes.

- Standard mode
  - Bi-directional SPP compliant
- Enhanced mode
  - EPP v1.7 compliant
  - EPP v1.9 compliant
- High-speed mode
  - ECP, IEEE 1284 compliant

#### 2.8.3.6 Super I/O Keyboard Controller

The Super I/O keyboard controller can execute the 8042 instruction set. Some of the keyboard controller features are listed below:

- The 8042 instruction is compatible with a PS/2 keyboard and PS/2 mouse
- Gate A20 and Keyboard reset output
- Supports multiple keyboard power on events
- Supports mouse double-click and/or mouse move power on events

## 2.9 Environmental and Power Specifications

### 2.9.1 System Monitoring

Three thermal inputs on the MXGA Super I/O Enhanced Hardware Monitor the following temperatures:

- System temperature
- Power temperature
- CPU temperature

Eight voltage inputs on the MXGA Super I/O Enhanced Hardware Monitor the following voltages:

- Vcore
- +2.5V
- +3.3V
- +5.0V
- +12.0V
- DDR Vtt
- +1.5V
- 5VSB

The MXGA Super I/O Enhanced Hardware Monitor also monitors the following voltages internally:

- VBAT

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The MXGA Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- CPU Fan speed

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

### 2.9.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the MXGA are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the northbridge and southbridge chipsets to ensure the operating temperature of these chips remain low.

### 2.9.3 Power Consumption

Table 2-6 shows the power consumption parameters for the MXGA running with an Intel® Pentium® 4, 3.73 GHz, 1066MHz CPU with 1GB of 677MHz DDR2 memory.

| Voltage | Current |
|---|---|
| **+3.3V** | **6.07A** |
| **+5V** | **4.25A** |
| **+12V** | **10.17A** |

**Table 2-6: Power Consumption**

Chapter

3

# Unpacking


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## 3.1 Anti-static Precautions

**WARNING**:

Failure to take ESD precautions during the installation of the MXGA may result in permanent damage to the MXGA and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the MXGA. Dry climates are especially susceptible to ESD. It is critical that the following anti-static precautions are strictly adhered to whenever handling the MXGA or any other electrical component.

- ***Wear an anti-static wristband*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the MXGA.
- ***Self-grounding*** - Touch a grounded conducting material before handling and periodically while handling the MXGA.
- ***Use an anti-static pad*** - When configuring the MXGA, place it on an antic-static pad to reduce the possibility of ESD damage.
- ***Only handle the edges of the MXGA*** - When handling the MXGA, hold it by its edges.

## 3.2 Unpacking

### 3.2.1 Unpacking Precautions

When the MXGA is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 3.1**.
- Make sure the packing box is facing upwards so the MXGA does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

## 3.3 Unpacking Checklist

**NOTE**:

If any components listed in the checklist below are missing, do not proceed with the installation. Contact CyberResearch, Inc. immediately by phone (203) 643-5000 or email: sales@cyberresearch.com

### 3.3.1 Package Contents

The MXGA is shipped with the following components:

| Quantity | Item | Image |
|---|---|---|
| 1 | MXGA | |
| 1 | ATA 66/100 flat cable | |


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| Quantity | Item | Image |
|---|---|---|
| 2 | Dual RS-232 cable | |
| 2 | SATA cables | |
| 1 | SATA power cable | |
| 1 | I/O Shielding | |
| 1 | Mini jumper Pack | |
| 1 | Utility CD | |

**Table 3-1: Package List Contents**

## 3.3.2 Optional Components

The following optional components are available from CyberResearch, Inc.

| Item and Part Number | Image |
|---|---|
| FDD cable | |
| RS-232/422/485 cable | |

| | |
|---|---|
| Dual USB cable | |
| Four USB cable | |

**Table 3-2: Optional Components**


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Chapter

4

# Connector Pinouts


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# 4.1 Peripheral Interface Connectors

**Section 4.1.1** shows peripheral interface connector locations. **Section 4.1.2** lists all the peripheral interface connectors seen in **Section 4.1.1**.

## 4.1.1 MXGA Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

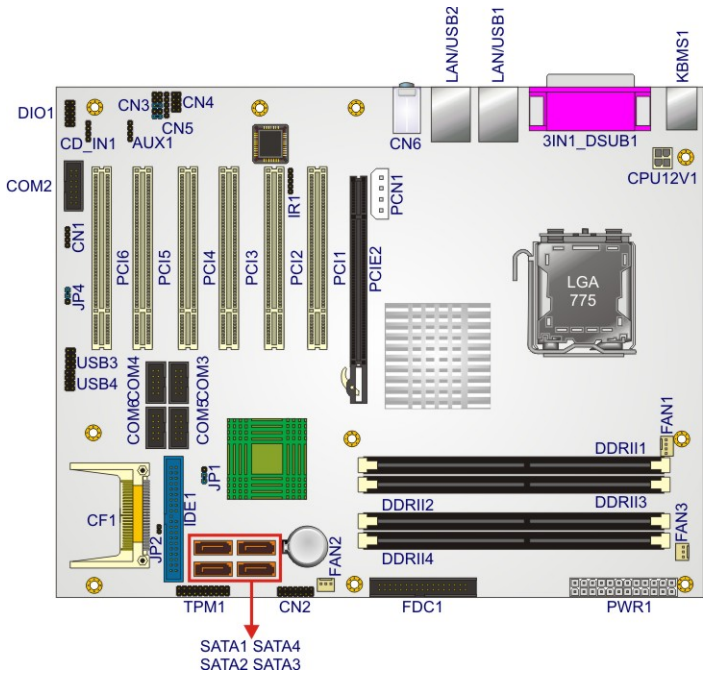


**Figure 4-1: Connector and Jumper Locations**

## 4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the MXGA. Detailed descriptions of these connectors can be found below.

| Connector | Type | Label |
|---|---|---|
| +12V ATX power connector | 4-pin header | CPU12V1 |
| ATX power connector | 24-pin header | PWR1 |

| Connector | Type | Label |
|---|---|---|
| **Audio connector** | **7-pin header** | **CN4** |
| **Auxiliary audio connector** | **4-pin header** | **AUX1** |
| **CD-in connector** | **4-pin header** | **CD_IN1** |
| **CompactFlash connector** | **50-pin CF slot** | **CF1** |
| **Digital input/output connector** | **10-pin header** | **DIO1** |
| **Fan connector - CPU** | **4-pin wafer** | **FAN1** |
| **Fan connector - System** | **3-pin wafer** | **FAN2** |
| **Fan connector - System** | **3-pin wafer** | **FAN3** |
| **Floppy disk drive connector** | **34-pin box header** | **FDC1** |
| **Front panel audio connector** | **10-pin header** | **CN3** |
| **IDE Interface connector** | **40-pin box header** | **IDE1** |
| **Infrared connector** | **5-pin header** | **IR1** |
| **Multi-panel connector** | **14-pin header** | **CN2** |
| **PCI Express x16 slot** | **82-pin PCIe x16 slot** | **PCIE2** |
| **PCI Express power connector** | **4-pin wafer** | **PCN1** |
| **PCI slot** | **124-pin PCI slot** | **PCI1** |
| **PCI slot** | **124-pin PCI slot** | **PCI2** |
| **PCI slot** | **124-pin PCI slot** | **PCI3** |
| **PCI slot** | **124-pin PCI slot** | **PCI4** |
| **PCI slot** | **124-pin PCI slot** | **PCI5** |
| **PCI slot** | **124-pin PCI slot** | **PCI6** |
| **SATA drive connector** | **7-pin SATA** | **SATA1** |
| **SATA drive connector** | **7-pin SATA** | **SATA2** |
| **SATA drive connector** | **7-pin SATA** | **SATA3** |
| **SATA drive connector** | **7-pin SATA** | **SATA4** |
| **Serial port connector (RS-232)** | **10-pin box header** | **COM3** |
| **Serial port connector (RS-232)** | **10-pin box header** | **COM4** |


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| Connector | Type | Label |
|---|---|---|
| **Serial port connector (RS-232)** | **10-pin box header** | **COM5** |
| **Serial port connector (RS-232)** | **10-pin box header** | **COM6** |
| **Serial port connector (RS-232/422/485)** | **14-pin header** | **COM2** |
| **Serial port connector (RS-422/485)** | **4-pin header** | **CN1** |
| **SPDIF connector** | **5-pin header** | **CN5** |
| **TPM connector** | **20-pin header** | **TPM1** |
| **USB connector** | **8-pin header** | **USB3** |
| **USB connector** | **8-pin header** | **USB4** |

**Table 4-1: Peripheral Interface Connectors**

### 4.1.3 External Peripheral Interface Panel Connectors

Table 4-2 lists the external peripheral interface panel connectors on the MXGA. Detailed descriptions of these connectors can be found in.

| Connector | Type | Label |
|---|---|---|
| **Keyboard/Mouse** | **PS/2** | **KBMS1** |
| **Parallel port connector** | **DB-25 (female)** | **3IN1_DSUB1A** |
| **Ethernet/USB connector** | **RJ-45/USB port combo connector** | **LAN/USB1B** |
| **Ethernet/USB connector** | **RJ-45/USB port combo connector** | **LAN/USB2B** |
| **Audio connector** | **3 x Audio jacks** | **CN6** |
| **VGA connector** | **DB-15 (female)** | **3IN1_DSUB1C** |
| **Serial connector** | **DB-9 (male)** | **3IN1_DSUB1B** |

**Table 4-2: External Peripheral Interface Panel Connectors**

## 4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the MXGA.

### 4.2.1 ATX Power Supply Connector (4-pins)

**CN Label:** CPU12V1

**CN Type:** 4-pin ATX power connector (1x4)

**CN Location:** See Figure 4-2

**CN Pinouts:** See Table 4-3

The 4-pin ATX power supply connector is connected to a +12V ATX power supply.

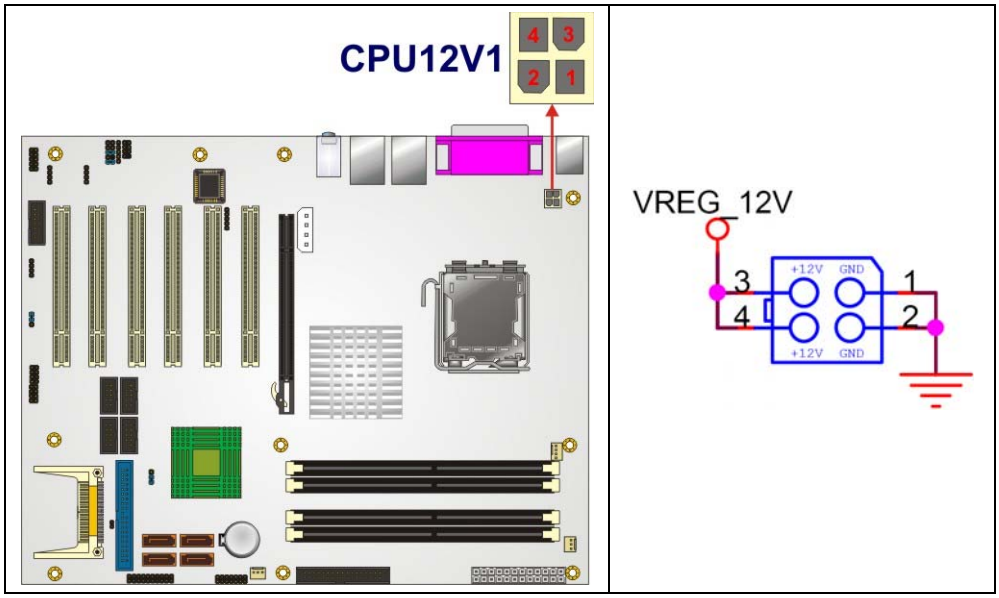


**Figure 4-2: ATX Power Supply Connector (4-pins) Location**

| PIN | DESCRIPTION |
|---|---|
| 1 | GND |
| 2 | GND |
| 3 | +12V |
| 4 | +12V |

**Table 4-3: ATX Power Supply Connector (4-pins) Pinouts**


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### 4.2.2 ATX Power Supply Connector (24-pins)

**CN Label:** PWR1

**CN Type:** 24-pin ATX power connector (2x12)

**CN Location:** See Figure 4-3

**CN Pinouts:** See Table 4-4

The 24-pin ATX power supply connector is connected to a ATX power supply.

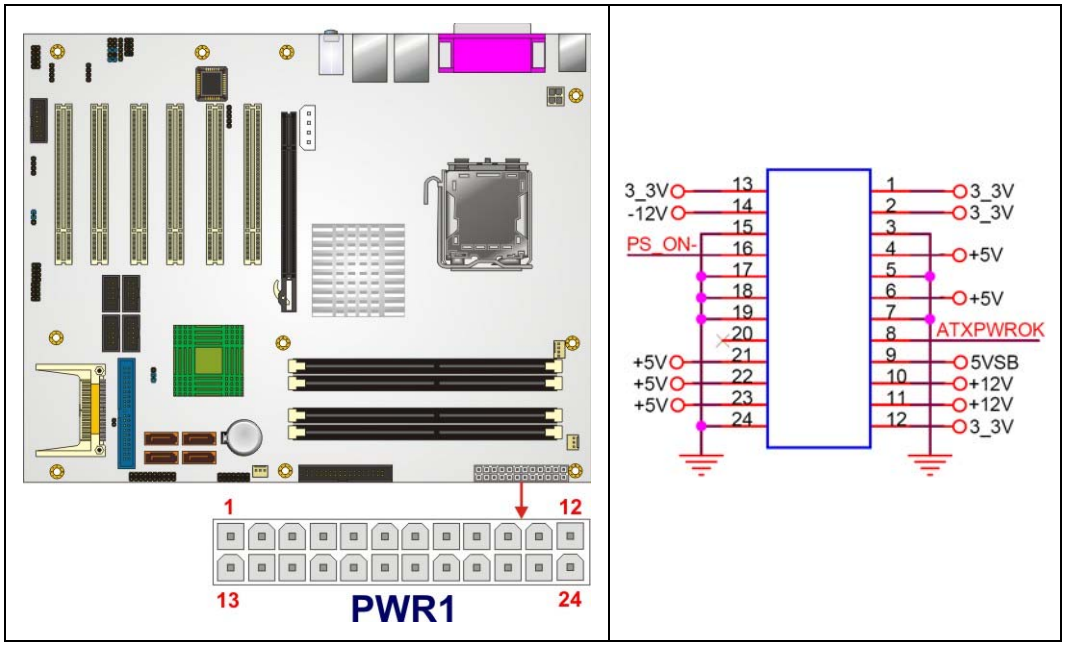


**Figure 4-3: ATX Power Connector Location**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | 3.3V01 | 13 | 3.3V04 |
| 2 | 3.3V02 | 14 | -12V |
| 3 | COM01 | 15 | COM |
| 4 | +5V01 | 16 | PS-ON |
| 5 | COM02 | 17 | COM04 |
| 6 | +5V02 | 18 | COM05 |
| 7 | COM03 | 19 | COM06 |

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 8 | PWR-OK | 20 | -5V |
| 9 | 5VSB | 21 | +5V03 |
| 10 | +12V01 | 22 | +5V04 |
| 11 | +12V02 | 23 | +5V05 |
| 12 | 3.3V03 | 24 | COM07 |

**Table 4-4: ATX Power Connector Pinouts**

### 4.2.3 Audio Connector (8-pin)

**CN Label:** CN4

**CN Type:** 7-pin header

**CN Location:** See Figure 4-4

**CN Pinouts:** See Table 4-5

The 8-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

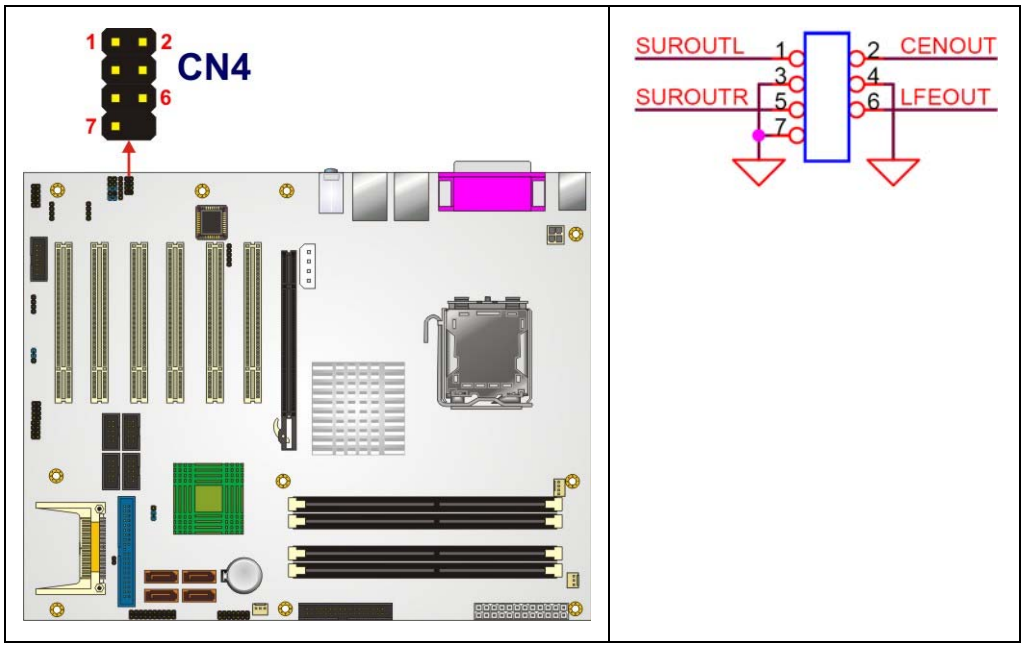


**Figure 4-4: Audio Connector Location (8-pin)**

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| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | SUROUTL | 2 | CENOUT |
| 3 | GND | 4 | GND |
| 5 | SUROUTL | 6 | LFEOUT |
| 7 | GND | | |

**Table 4-5: Audio Connector Pinouts (8-pin)**

### 4.2.4 Auxiliary Audio Connector (4-pin)

**CN Label:** AUX1

**CN Type:** 4-pin header

**CN Location:** See Figure 4-5

**CN Pinouts:** See Table 4-6

The 4-pin auxiliary audio connector provides a second audio input to the system.

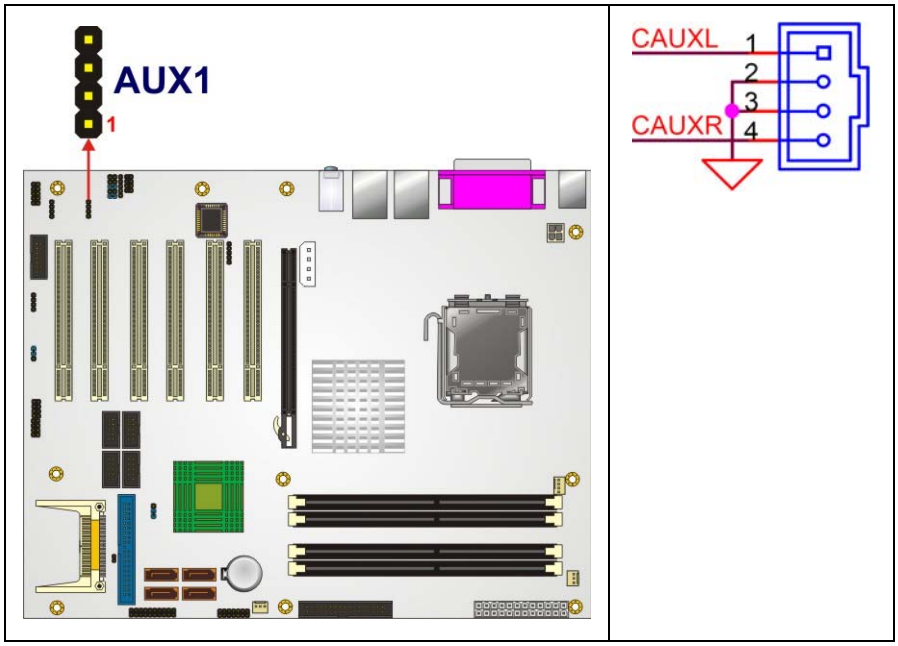


**Figure 4-5: Auxiliary Audio Connector Location (4-pin)**

| PIN | DESCRIPTION |
|---|---|
| 1 | CAUXL |
| 2 | GND |
| 3 | GND |
| 4 | CAUXR |

**Table 4-6: Auxiliary Audio Connector Pinouts (4-pin)**

### 4.2.5 CD-In Connector

**CN Label:** CD_IN1

**CN Type:** 4-pin header

**CN Location:** See Figure 4-6

**CN Pinouts:** See Table 4-7

The 4-pin CD-in connector connects a CD to the system.

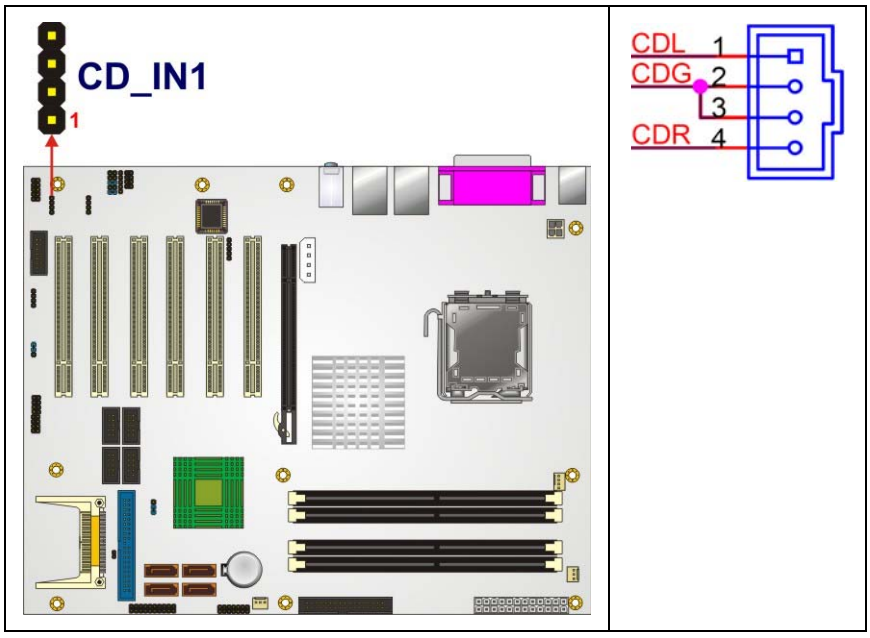


**Figure 4-6: CD-In Connector**


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| PIN | DESCRIPTION |
|---|---|
| 1 | CDL |
| 2 | GND |
| 3 | GND |
| 4 | CDR |

**Table 4-7: CD-In Connector**

### 4.2.6 Compact Flash Socket

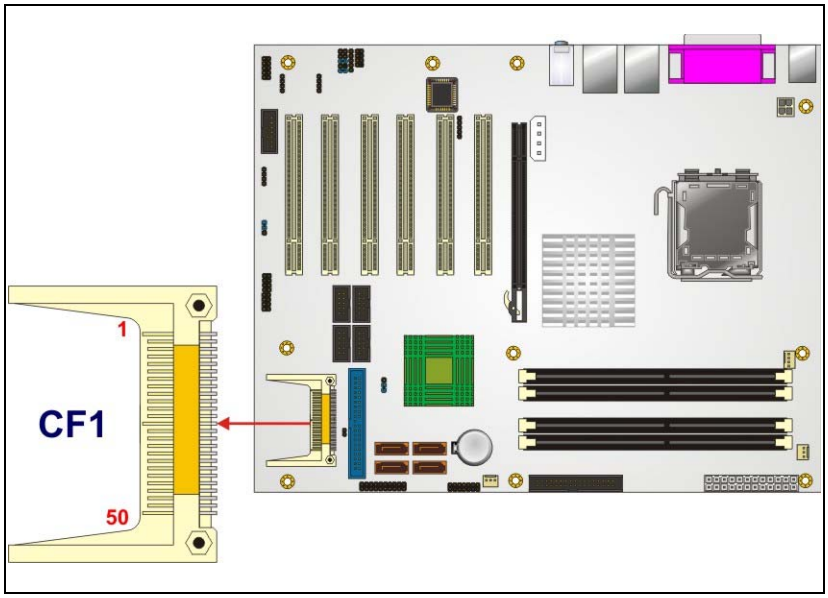
**CN Label:** **CF1**

**CN Type:** 50-pin header (2x25)

**CN Location:** See **Figure 4-7**

**CN Pinouts:** See **Table 4-8**

A CF Type I or Type II memory card inserts into the CF socket on the motherboard.



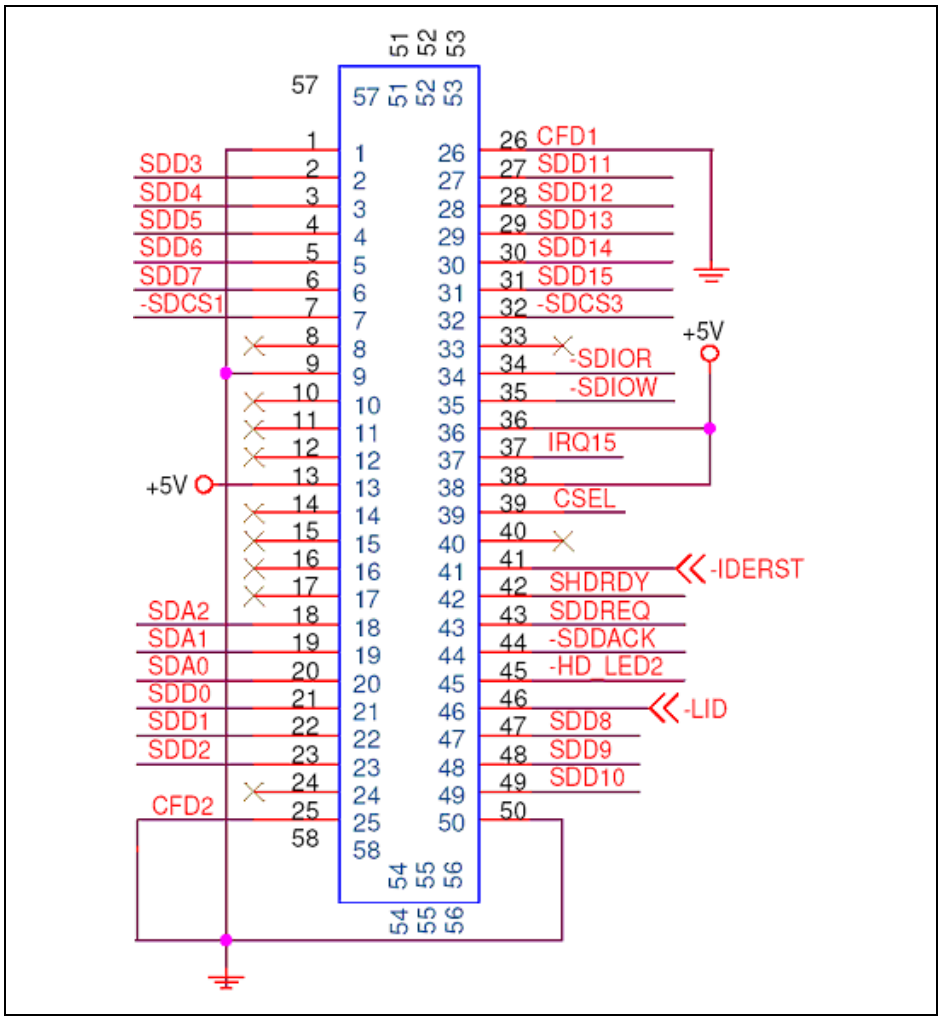



**Figure 4-7: CF Card Socket Location**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | GROUND | 26 | VCC-IN CHECK1 |
| 2 | DATA 3 | 27 | DATA 11 |
| 3 | DATA 4 | 28 | DATA 12 |
| 4 | DATA 5 | 29 | DATA 13 |
| 5 | DATA 6 | 30 | DATA 14 |
| 6 | DATA 7 | 31 | DATA 15 |
| 7 | HDC_CS0# | 32 | HDC_CS1 |
| 8 | N/C | 33 | N/C |
| 9 | GROUND | 34 | IOR# |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| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 10 | N/C | 35 | IOW# |
| 11 | N/C | 36 | VCC_COM |
| 12 | N/C | 37 | IRQ15 |
| 13 | VCC_COM | 38 | VCC_COM |
| 14 | N/C | 39 | CSEL |
| 15 | N/C | 40 | N/C |
| 16 | N/C | 41 | HDD_RESET |
| 17 | N/C | 42 | IORDY |
| 18 | SA2 | 43 | SDREQ |
| 19 | SA1 | 44 | SDACK# |
| 20 | SA0 | 45 | HDD_ACTIVE# |
| 21 | DATA 0 | 46 | 66DET |
| 22 | DATA 1 | 47 | DATA 8 |
| 23 | DATA 2 | 48 | DATA 9 |
| 24 | N/C | 49 | DATA 10 |
| 25 | VCC-IN CHECK2 | 50 | GROUND |

**Table 4-8: CF Card Socket Pinouts**

### 4.2.7 Digital Input/Output (DIO) Connector

**CN Label:** DIO1

**CN Type:** 10-pin header (2x5)

**CN Location:** See Figure 4-8

**CN Pinouts:** See Table 4-9

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

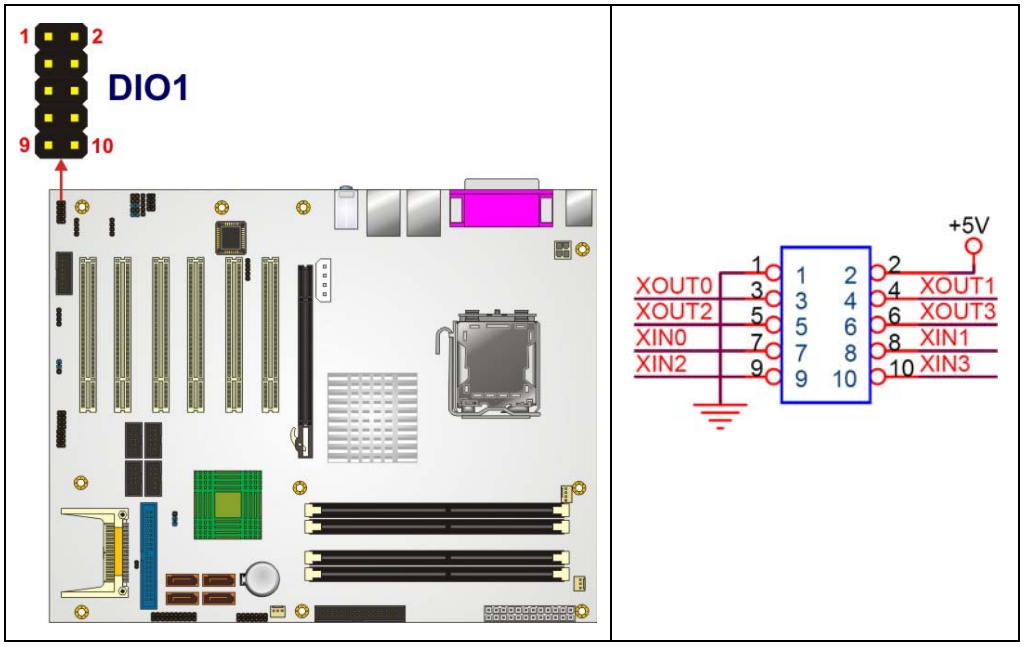


**Figure 4-8: DIO Connector Locations**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | GND | 2 | PWR (+5V) |
| 3 | XOUT0 | 4 | XOUT1 |
| 5 | XOUT3 | 6 | XOUT4 |
| 7 | XIN0 | 8 | XIN1 |
| 9 | XIN2 | 10 | XIN3 |

**Table 4-9: DIO Connector Pinouts**


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### 4.2.8 Fan Connectors

**CN Label:** FAN1, FAN2, FAN3

**CN Type:** FAN1: 4-pin wafer connector
FAN1, FAN2: 3-pin wafer connector

**CN Location:** See Figure 4-9

**CN Pinouts:** See Table 4-10

The FAN1, FAN2 and FAN3 cooling fan connectors provide a 12V current to the cooling fans. The connector has a "rotation" pin to get rotation signals from the fan and notify the system so the system BIOS can recognize the fan speed. Please note that only certain fans can issue the rotation signals.

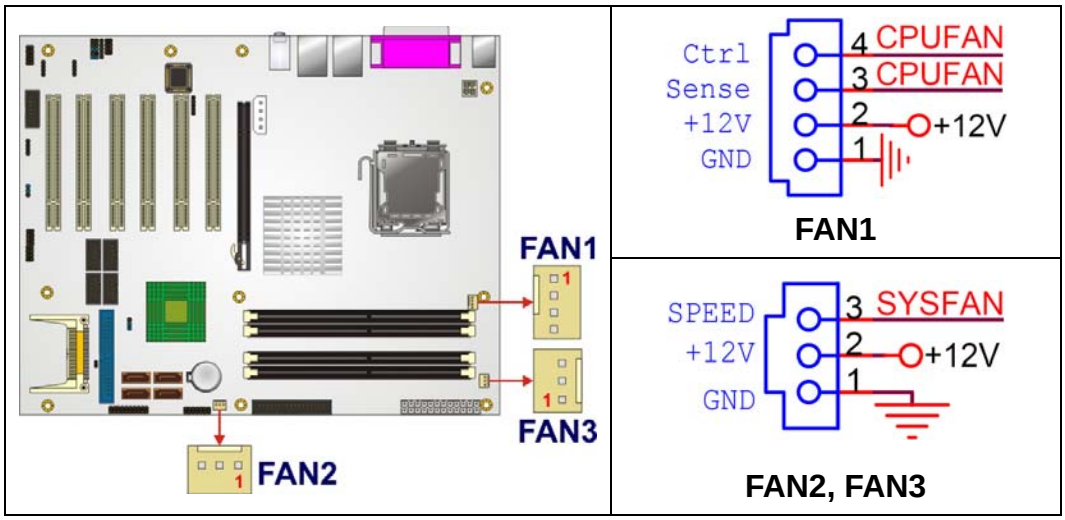


**Figure 4-9: Fan Connectors Locations**

| PIN | FAN1 | FAN2, FAN3 |
|---|---|---|
| 1 | GND | GND |
| 2 | +12V | +12V |
| 3 | Rotation Signal | Rotation Signal |
| 4 | Control | |

**Table 4-10: Fan Connectors Pinouts**

### 4.2.9 Floppy Disk Connector

**CN Label:** FDC1

**CN Type:** 34-pin header (2x17)

**CN Location:** See Figure 4-10

**CN Pinouts:** See Table 4-11

The floppy disk connector is connected to a floppy disk drive.

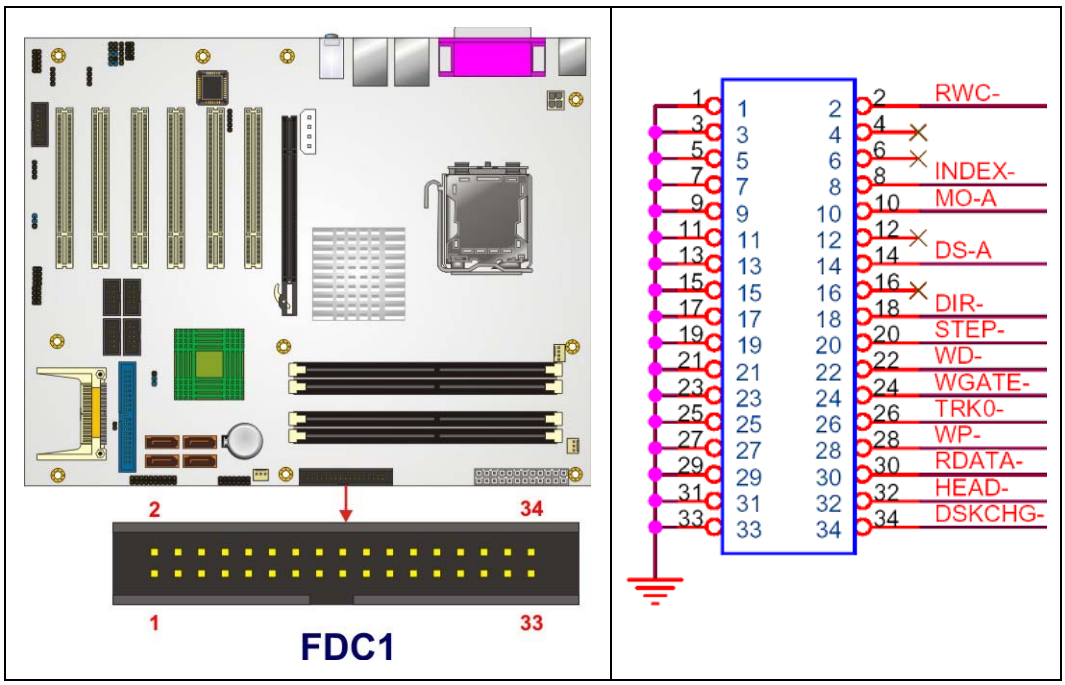


**Figure 4-10: FDC Connector Location**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | GND | 2 | REDUCE WRITE |
| 3 | GND | 4 | N/C |
| 5 | N/C | 6 | N/C |
| 7 | GND | 8 | INDEX# |
| 9 | GND | 10 | MOTOR ENABLE A# |
| 11 | GND | 12 | DRIVE SELECT B# |


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| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 13 | GND | 14 | DRIVE SELECT A# |
| 15 | GND | 16 | MOTOR ENABLE B# |
| 17 | GND | 18 | DIRECTION# |
| 19 | GND | 20 | STEP# |
| 21 | GND | 22 | WRITE DATA# |
| 23 | GND | 24 | WRITE GATE# |
| 25 | GND | 26 | TRACK 0# |
| 27 | GND | 28 | WRITE PROTECT# |
| 29 | GND | 30 | READ DATA# |
| 31 | GND | 32 | SIDE 1 SELECT# |
| 33 | GND | 34 | DISK CHANGE# |

**Table 4-11: FDC Connector Pinouts**

### 4.2.10 Front Panel Audio Connector

**CN Label:** CN3

**CN Type:** 10-pin header (2x6)

**CN Location:** See Figure 4-11

**CN Pinouts:** See Table 4-12

The front panel audio connector connects to external audio devices via a system's front panel audio interfaces.

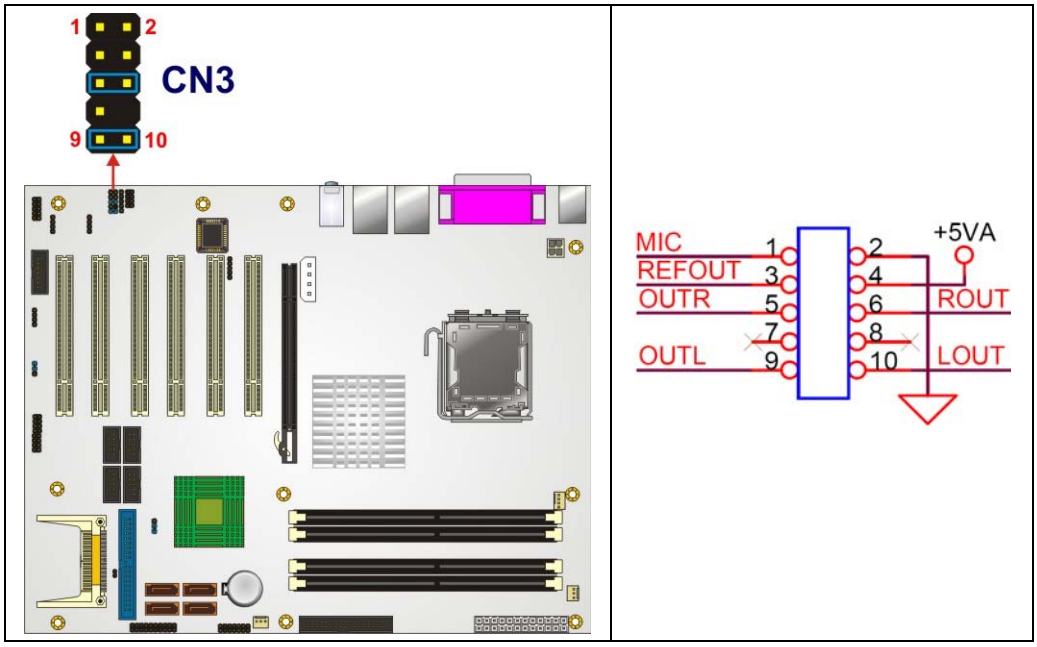


**Figure 4-11: Front Panel Connector Pinout Locations**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | MIC IN | 2 | GND AUDIO |
| 3 | MIC BIAS | 4 | 5V |
| 5 | LINE OUT (R) | 6 | LINE OUT (R) Return |
| 7 | NC | 8 | NC |
| 9 | LINE OUT (L) | 10 | LINE OUT (L) Return |

**Table 4-12: Front Panel Connector Pinouts**


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### 4.2.11 IDE Connector (40-pin)

**CN Label:** IDE1

**CN Type:** 40-pin box header (2x20)

**CN Location:** See Figure 4-12

**CN Pinouts:** See Table 4-13

One 40-pin IDE device connector on the MXGA supports connectivity to two hard disk drives.

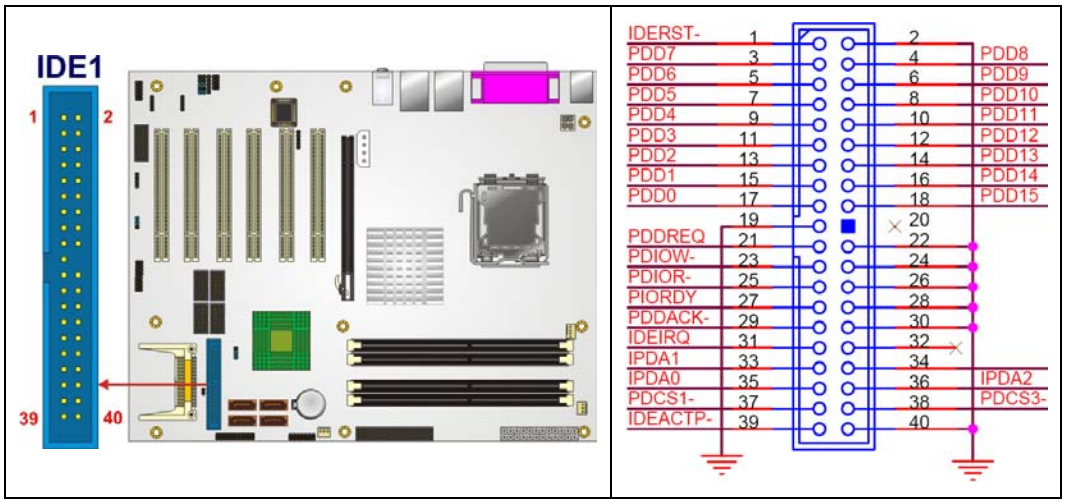


**Figure 4-12: IDE Device Connector Locations**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | RESET# | 2 | GROUND |
| 3 | DATA 7 | 4 | DATA 8 |
| 5 | DATA 6 | 6 | DATA 9 |
| 7 | DATA 5 | 8 | DATA 10 |
| 9 | DATA 4 | 10 | DATA 11 |
| 11 | DATA 3 | 12 | DATA 12 |
| 13 | DATA 2 | 14 | DATA 13 |
| 15 | DATA 1 | 16 | DATA 14 |
| 17 | DATA 0 | 18 | DATA 15 |

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 19 | GROUND | 20 | N/C |
| 21 | IDE DRQ | 22 | GROUND |
| 23 | IOW# | 24 | GROUND |
| 25 | IOR# | 26 | GROUND |
| 27 | IDE CHRDY | 28 | GROUND |
| 29 | IDE DACK | 30 | GROUND–DEFAULT |
| 31 | INTERRUPT | 32 | N/C |
| 33 | SA1 | 34 | N/C |
| 35 | SA0 | 36 | SA2 |
| 37 | HDC CS0# | 38 | HDC CS1# |
| 39 | HDD ACTIVE# | 40 | GROUND |

**Table 4-13: IDE Connector Pinouts**

### 4.2.12 Infrared Interface Connector (5-pin)

**CN Label:** IR1

**CN Type:** 5-pin header (1x5)

**CN Location:** See Figure 4-13

**CN Pinouts:** See Table 4-14

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.


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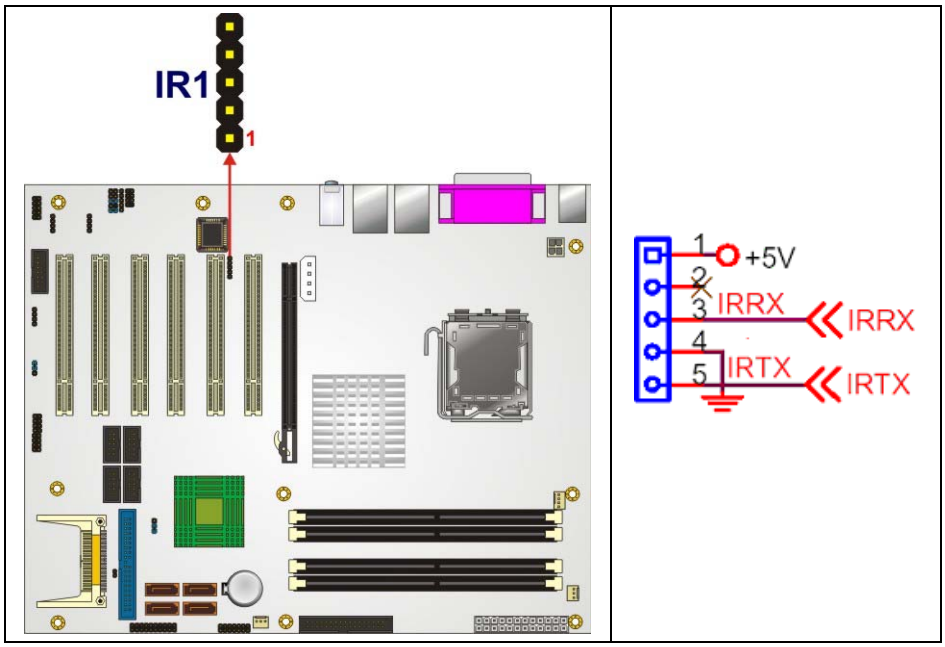


**Figure 4-13: Infrared Connector Pinout Locations**

| PIN | DESCRIPTION |
|---|---|
| 1 | VCC |
| 2 | NC |
| 3 | IR-RX |
| 4 | GND |
| 5 | IR-TX |

**Table 4-14: Infrared Connector Pinouts**

## 4.2.13 Multi-panel Connector

**CN Label:** CN2

**CN Type:** 14-pin header (2x7)

**CN Location:** See Figure 4-14

**CN Pinouts:** See Table 4-15

The multi-panel connector connects to external switches and indicators to monitor and controls the motherboard. These indicators and switches include:

- Power button
- Reset button
- Power LED
- HDD LED
- PC speaker

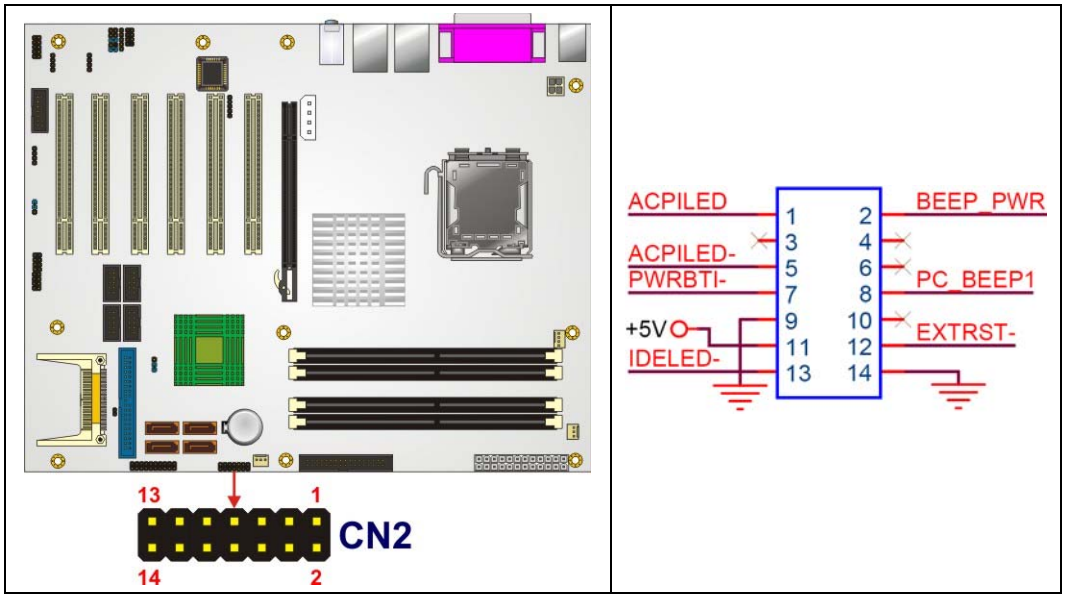


**Figure 4-14: Multi-panel Connector Location**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | ACPILED+ | 2 | SPEAKER+ |
| 3 | N/C | 4 | N/C |
| 5 | ACPILED- | 6 | N/C |
| 7 | ATX POWER BUTTON | 8 | SPEAKER- |
| 9 | GND | 10 | N/C |
| 11 | IDE LED+ | 12 | RESET SW |
| 13 | IDE LED - | 14 | GND |

**Table 4-15: Multi-panel Connector Pinouts**


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### 4.2.14 PCI Express x16 Slot

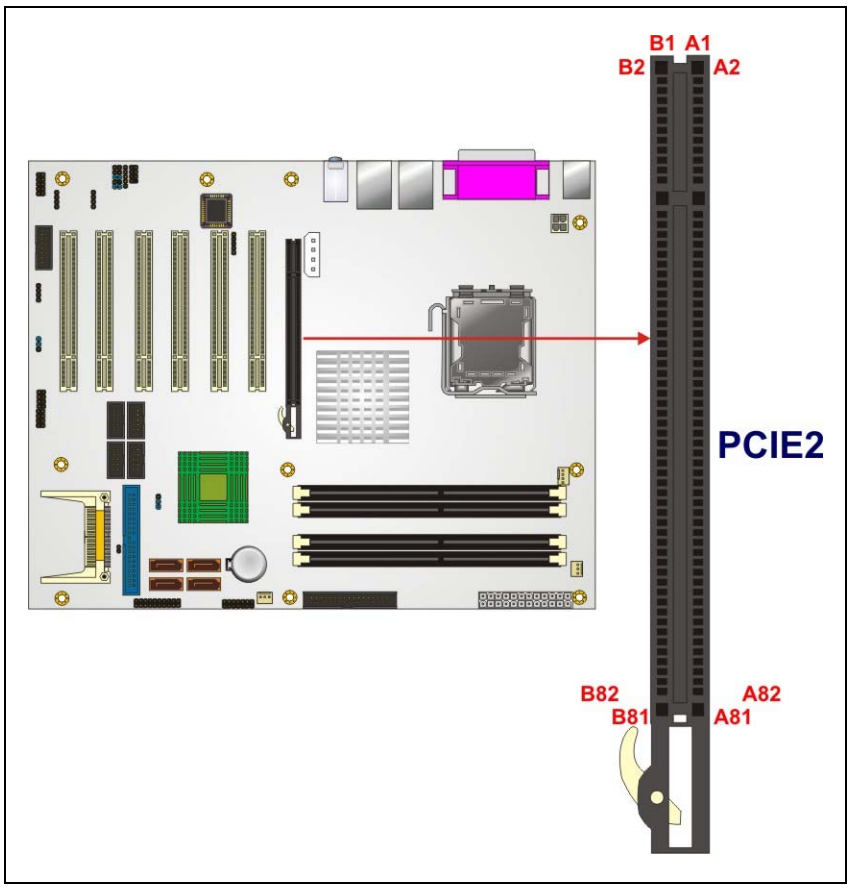
**CN Label:** **PCIE2**

**CN Type:** 82-pin PCIe x16 slot

**CN Location:** See Figure 4-15

**CN Pinouts:** See **Table 4-16** (**Side A**) Table 4-17 **(Side B)**

PCIe x16 expansion devices can be inserted into the PCIe x16 slot.



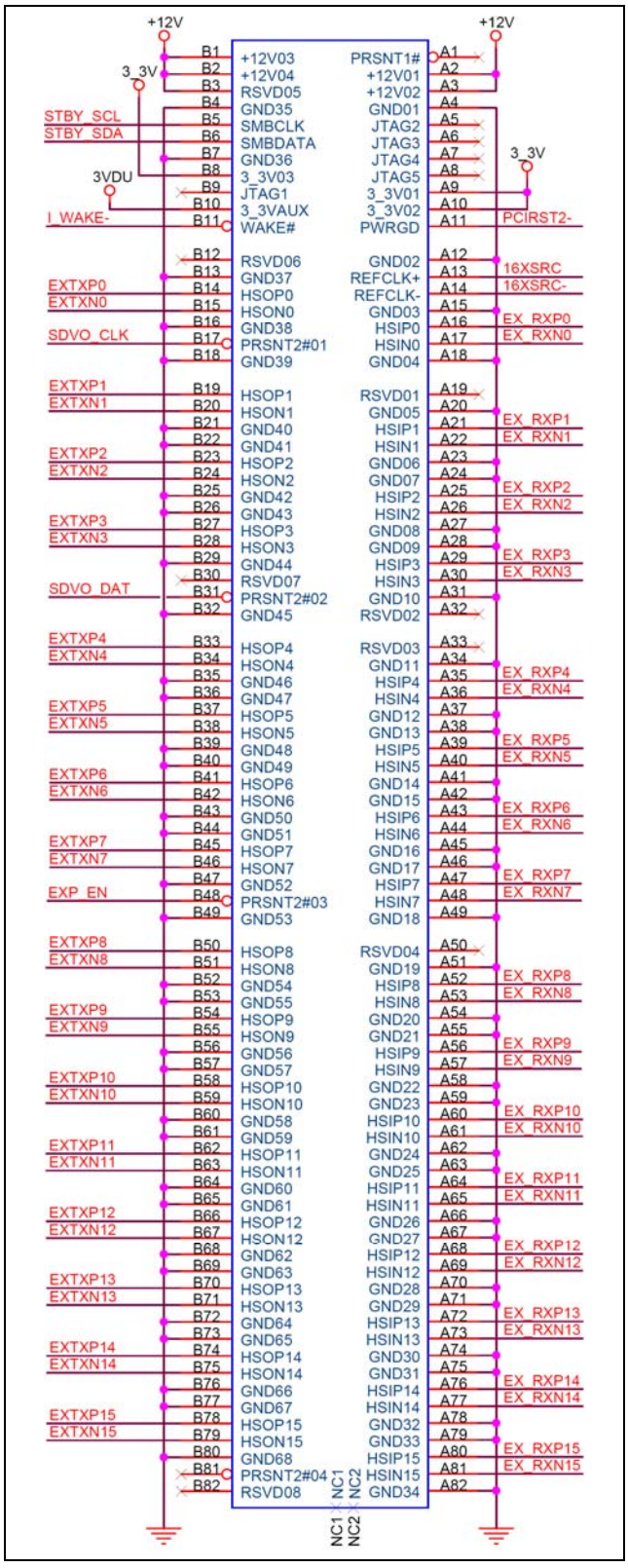



**Figure 4-15: PCI Express x16 Slot Connector Location**

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| PIN | NAME | PIN | NAME | PIN | NAME | PIN | NAME |
|---|---|---|---|---|---|---|---|
| A1 | Name | A22 | HSIn(1) | A43 | HSIp(6) | A64 | HSIp(11) |
| A2 | PRSNT#1 | A23 | GND | A44 | HSIn(6) | A65 | HSIn(11) |
| A3 | +12v | A24 | GND | A45 | GND | A66 | GND |
| A4 | +12v | A25 | HSIp(2) | A46 | GND | A67 | GND |
| A5 | GND | A26 | HSIn(2) | A47 | HSIp(7) | A68 | HSIp(12) |
| A6 | JTAG2 | A27 | GND | A48 | HSIn(7) | A69 | HSIn(12) |
| A7 | JTAG3 | A28 | GND | A49 | GND | A70 | GND |
| A8 | JTAG4 | A29 | HSIp(3) | A50 | RSVD | A71 | GND |
| A9 | JTAG5 | A30 | HSIn(3) | A51 | GND | A72 | HSIp(13) |
| A10 | +3.3v | A31 | GND | A52 | HSIp(8) | A73 | HSIn(13) |
| A11 | +3.3v | A32 | RSVD | A53 | HSIn(8) | A74 | GND |
| A12 | PWRGD | A33 | RSVD | A54 | GND | A75 | GND |
| A13 | GND | A34 | GND | A55 | GND | A76 | HSIp(14) |
| A14 | REFCLK+ | A35 | HSIp(4) | A56 | HSIp(9) | A77 | HSIn(14) |
| A15 | REFCLK- | A36 | HSIn(4) | A57 | HSIn(9) | A78 | GND |
| A16 | GND | A37 | GND | A58 | GND | A79 | GND |
| A17 | HSIp(0) | A38 | GND | A59 | GND | A80 | HSIp(15) |
| A18 | HSIn(0) | A39 | HSIp(5) | A60 | HSIp(10) | A81 | HSIn(15) |
| A19 | GND | A40 | HSIn(5) | A61 | HSIn(10) | A82 | GND |
| A20 | RSVD | A41 | GND | A62 | GND | | |
| A21 | GND | A42 | GND | A63 | GND | | |

**Table 4-16: PCIe x16 Side A Pinouts**

| PIN | NAME | PIN | NAME | PIN | NAME | PIN | NAME |
|---|---|---|---|---|---|---|---|
| B1 | +12v | B22 | GND | B43 | GND | B64 | GND |
| B2 | +12v | B23 | HSOp(2) | B44 | GND | B65 | GND |
| B3 | RSVD | B24 | HSOn(2) | B45 | HSOp(7) | B66 | HSOp(12) |
| B4 | GND | B25 | GND | B46 | HSOn(7) | B67 | HSOn(12) |
| B5 | SMCLK | B26 | GND | B47 | GND | B68 | GND |
| B6 | SMDAT | B27 | HSOp(3) | B48 | PRSNT#2 | B69 | GND |
| B7 | GND | B28 | HSOn(3) | B49 | GND | B70 | HSOp(13) |
| B8 | +3.3v | B29 | GND | B50 | HSOp(8) | B71 | HSOn(13) |
| B9 | JTAG1 | B30 | RSVD | B51 | HSOn(8) | B72 | GND |
| B10 | 3.3Vaux | B31 | PRSNT#2 | B52 | GND | B73 | GND |
| B11 | WAKE# | B32 | GND | B53 | GND | B74 | HSOp(14) |
| B12 | RSVD | B33 | HSOp(4) | B54 | HSOp(9) | B75 | HSOn(14) |
| B13 | GND | B34 | HSOn(4) | B55 | HSOn(9) | B76 | GND |
| B14 | HSOp(0) | B35 | GND | B56 | GND | B77 | GND |
| B15 | HSOn(0) | B36 | GND | B57 | GND | B78 | HSOp(15) |
| B16 | GND | B37 | HSOp(5) | B58 | HSOp(10) | B79 | HSOn(15) |
| B17 | PRSNT#2 | B38 | HSOn(5) | B59 | HSOn(10) | B80 | GND |
| B18 | GND | B39 | GND | B60 | GND | B81 | PRSNT#2 |
| B19 | HSOp(1) | B40 | GND | B61 | GND | B82 | RSVD#2 |
| B20 | HSOn(1) | B41 | HSOp(6) | B62 | HSOp(11) | | |
| B21 | GND | B42 | HSOn(6) | B63 | HSOn(11) | | |

**Table 4-17: PCIe x16 Side B Pinouts**

### 4.2.15 PCI Express Power Connector (4-pin)

**CN Label:** PCN1

**CN Type:** 4-pin wafer (1x4)

**CN Location:** See Figure 4-16

**CN Pinouts:** See Table 4-18


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The PCI Express power connector provides 12V power to PCIe expansion cards.

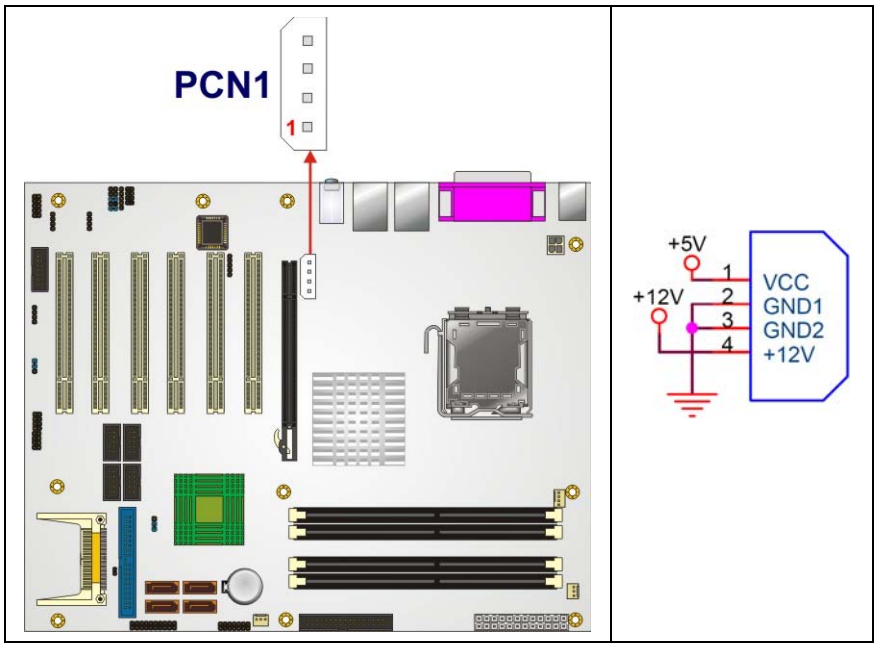



**Figure 4-16: PCI Express Power Connector Pinout Locations**

| PIN | DESCRIPTION |
|---|---|
| 1 | VCC |
| 2 | GND |
| 3 | GND |
| 4 | +12V |

**Table 4-18: PCI Express Power Connector Pinouts**

### 4.2.16 PCI Slot

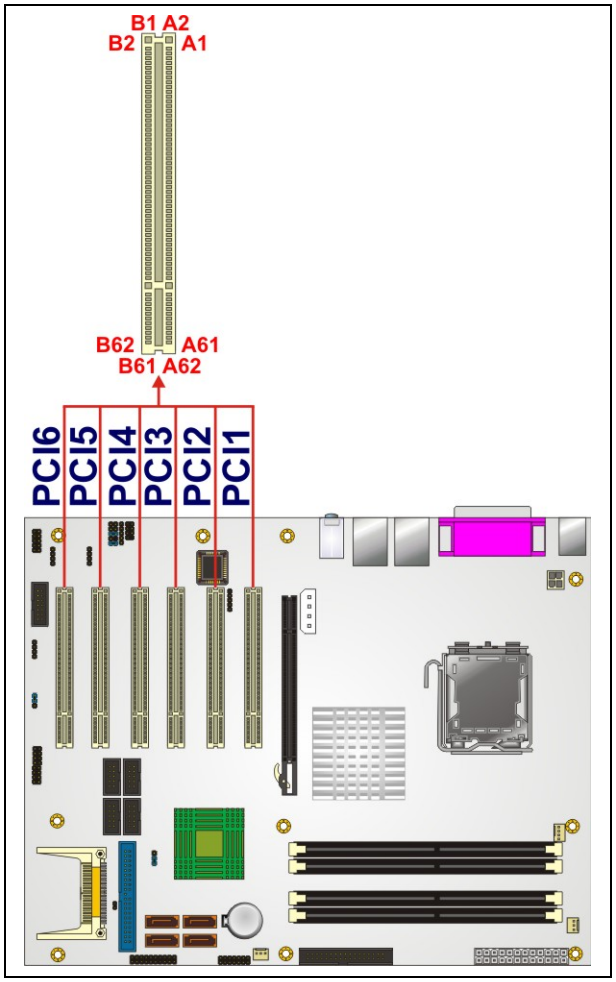
**CN Label:** **PCI1** to **PCI6**

**CN Type:** PCI Slot

**CN Location:** See **Figure** 4-17

**CN Pinouts:** See **Table 4-19**

The PCI slot enables a PCI expansion module to be connected to the board.

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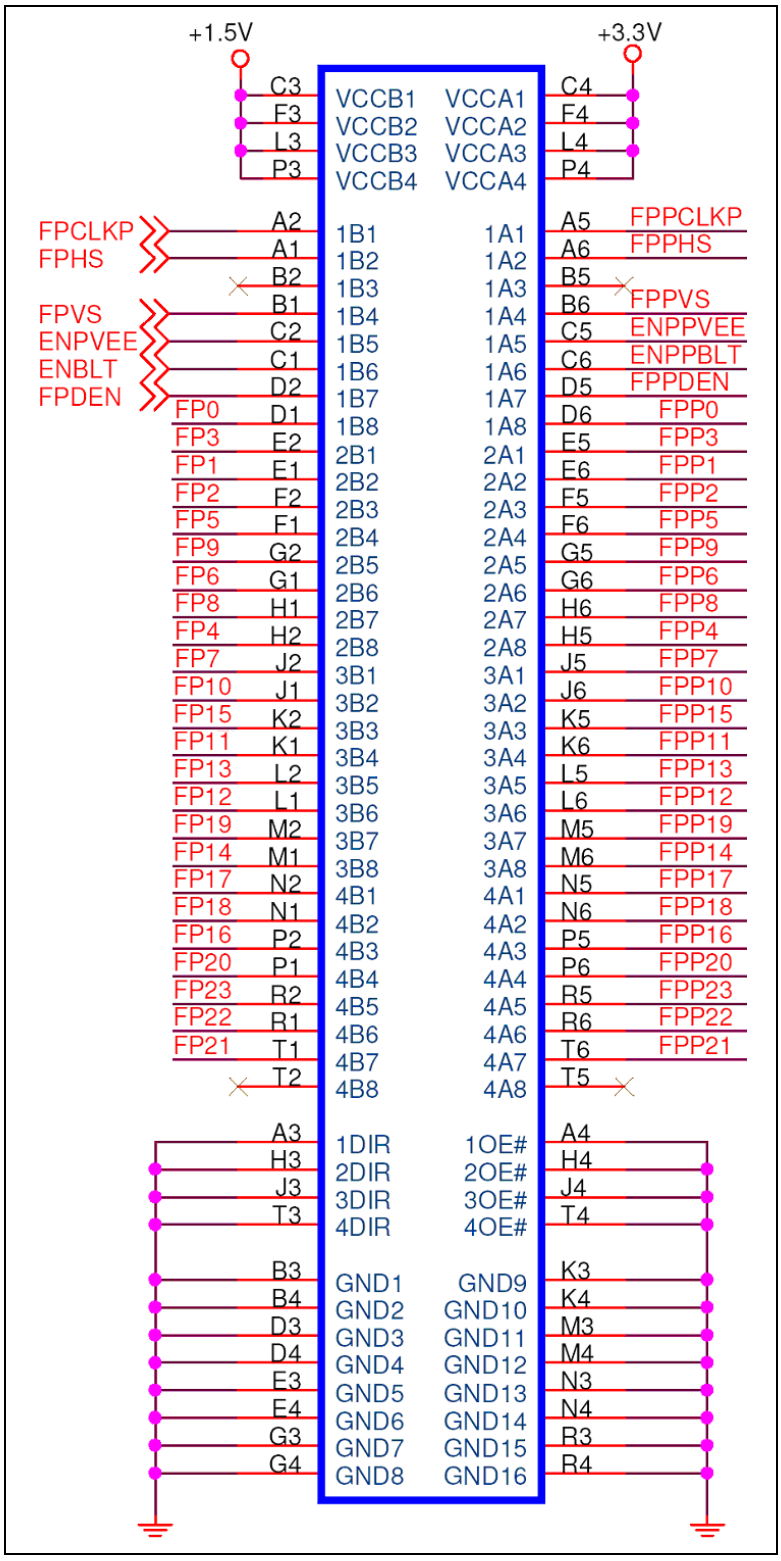


**Figure 4-17: PCI Slot Location**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| A1 | TRST | B1 | -12V |
| A2 | +12V | B2 | TCK |
| A3 | TMS | B3 | GND |
| A4 | TDI | B4 | TDO |
| A5 | +5V | B5 | +5V |
| A6 | INTA | B6 | +5V |
| A7 | INTC | B7 | INTB |
| A8 | +5V | B8 | INTD |
| A9 | RESERVED3 | B9 | PRSNT1 |
| A10 | +5V | B10 | RESERVED1 |
| A11 | RESERVED4 | B11 | PRSNT2 |
| A12 | GND | B12 | GND |
| A13 | GND | B13 | GND |
| A14 | 3.3V_AUX | B14 | RESERVED2 |
| A15 | RST | B15 | GND |
| A16 | +5V | B16 | CLK |
| A17 | GNT | B17 | GND |
| A18 | GND | B18 | REQ |
| A19 | PME | B19 | +5V |
| A20 | AD30 | B20 | AD31 |
| A21 | +3.3V | B21 | AD29 |
| A22 | AD28 | B22 | GND |
| A23 | AD26 | B23 | AD27 |
| A24 | GND | B24 | AD25 |
| A25 | AD24 | B25 | +3.3V |
| A26 | IDSEL | B26 | C/BE3 |
| A27 | +3.3V | B27 | AD23 |
| A28 | AD22 | B28 | GND |
| A29 | AD20 | B29 | AD21 |
| A30 | GND | B30 | AD19 |
| A31 | AD18 | B31 | +3.3V |
| A32 | AD16 | B32 | AD17 |


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| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| A33 | +3.3V | B33 | C/BE2 |
| A34 | FRAME | B34 | GND |
| A35 | GND | B35 | IRDY |
| A36 | TRDY | B36 | +3.3V |
| A37 | GND | B37 | DEVSEL |
| A38 | STOP | B38 | GND |
| A39 | +3.3V | B39 | LOCK |
| A40 | SDONE | B40 | PERR |
| A41 | SBO | B41 | +3.3V |
| A42 | GND | B42 | SERR |
| A43 | PAR | B43 | +3.3V |
| A44 | AD15 | B44 | C/BE1 |
| A45 | +3.3V | B45 | AD14 |
| A46 | AD13 | B46 | GND |
| A47 | AD11 | B47 | AD12 |
| A48 | GND | B48 | AD10 |
| A49 | AD9 | B49 | GND |
| A52 | C/BE0 | B52 | AD8 |
| A53 | +3.3V | B53 | AD7 |
| A54 | AD6 | B54 | +3.3V |
| A55 | AD4 | B55 | AD5 |
| A56 | GND | B56 | AD3 |
| A57 | AD2 | B57 | GND |
| A68 | AD0 | B68 | AD1 |
| A59 | +5V | B59 | +5V |
| A60 | REQ64 | B60 | ACK64 |
| A61 | +5V | B61 | +5V |
| A62 | +5V | B62 | +5V |

**Table 4-19: PCI Slot**

### 4.2.17 SATA Drive Connectors

**CN Label:** SATA1, SATA2, SATA3 and SATA4

**CN Type:** 7-pin SATA drive connectors

**CN Location:** See Figure 4-18

**CN Pinouts:** See Table 4-20

The SATA drive connectors are connected to SATA 3Gb/s disk drives that transfer data at speeds as high as 3.0Gb/s.

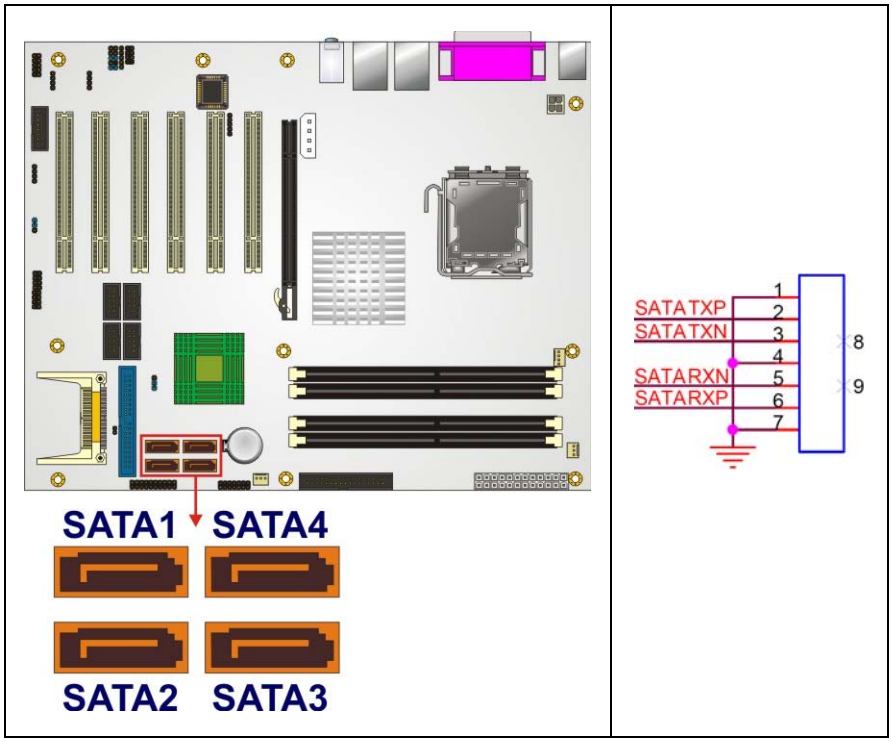


**Figure 4-18: SATA Drive Connector Locations**


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| PIN | DESCRIPTION |
|---|---|
| 1 | GND |
| 2 | TX+ |
| 3 | TX- |
| 4 | GND |
| 5 | RX- |
| 6 | RX+ |
| 7 | GND |

**Table 4-20: SATA Drive Connector Pinouts**

## 4.2.18 Serial Port Connector (RS-232)

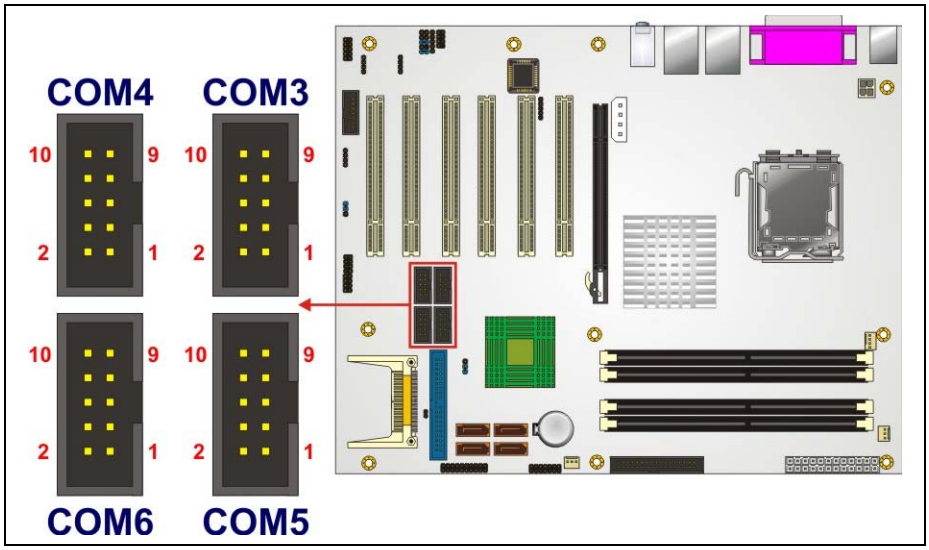
**CN Label:** COM3 to COM6

**CN Type:** 10-pin box header (2x5)

**CN Location:** See Figure 4-19

**CN Pinouts:** See Table 4-21

The 10-pin serial port connectors provide RS-232 serial communications channels that can be connected to external RS-232 serial port devices.



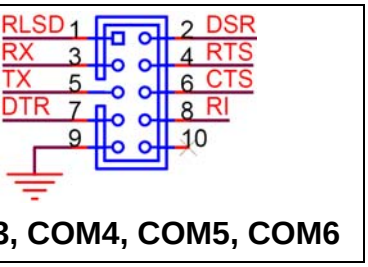



**Figure 4-19: Serial Port Connector (RS-232) Pinout Locations**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | DCD- | 6 | DSR- |
| 2 | SIN | 7 | RTS- |
| 3 | SOUT | 8 | CTS- |
| 4 | DTR- | 9 | RI |
| 5 | GND | 10 | GND |

**Table 4-21: Serial Port Connector (RS-232) Pinouts**

## 4.2.19 Serial Port Connector (RS-232/422/485)

**CN Label:** COM2

**CN Type:** 14-pin header (2x7)

**CN Location:** See Figure 4-20

**CN Pinouts:** See Table 4-22

The 14-pin serial port connector provides an RS-232/422/485 serial communications channel that can be connected to external RS-232/422/485 serial port devices. The signal type is controlled via the JP4 jumper and is shared with the CN1 connector.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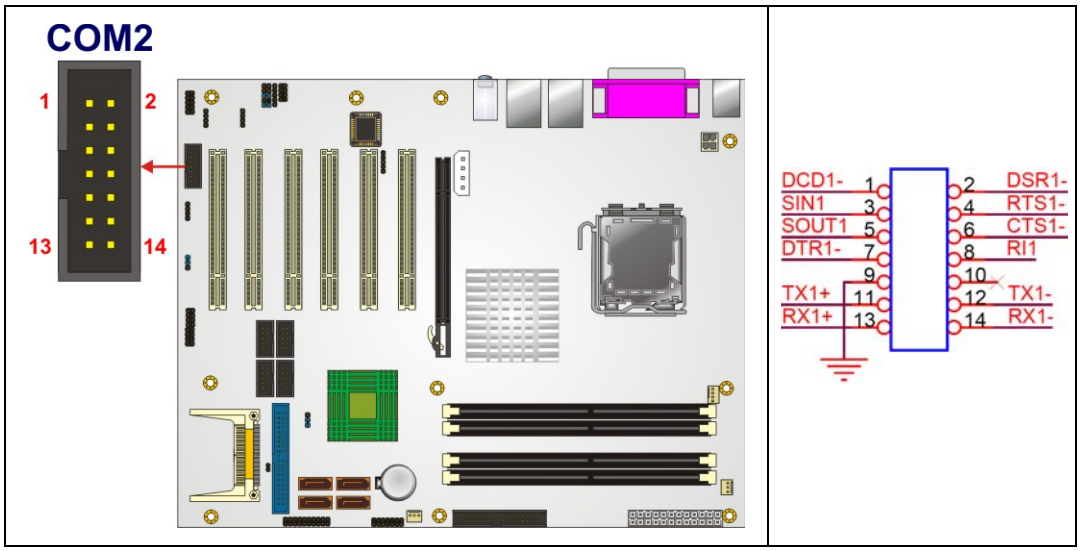


**Figure 4-20: Serial Port Connector (RS-232/422/485) Pinout Locations**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | DCD | 2 | DSR |
| 3 | RXD | 4 | RTS |
| 5 | TXD | 6 | CTX |
| 7 | DTR | 8 | RI |
| 9 | GND | 10 | NC |
| 11 | TXD1+ | 12 | TXD1- |
| 13 | RXD1+ | 14 | RXD1- |

**Table 4-22: Serial Port Connector (RS-232/422/485) Pinouts**

### 4.2.20 Serial Port Connector (RS-422/485)

**CN Label:** CN1

**CN Type:** 4-pin header

**CN Location:** See Figure 4-21

**CN Pinouts:** See Table 4-23

The 4-pin serial port connector provides RS-422/485 serial communications channels that can be connected to external RS-422/485 serial port devices. The port is shared with the COM2 port.

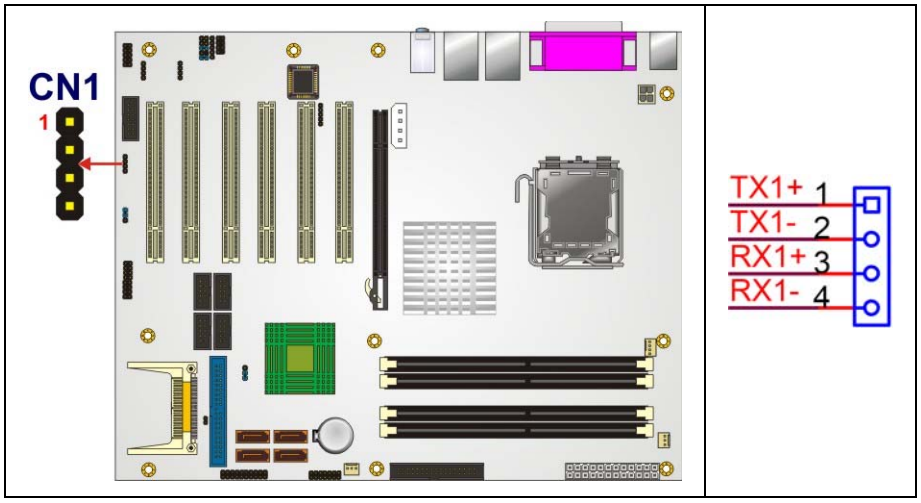


**Figure 4-21: Serial Port Connector (RS-422/485) Pinout Locations**

| PIN | DESCRIPTION |
|---|---|
| 1 | TXD1+ |
| 2 | TXD1- |
| 3 | RXD1+ |
| 4 | RXD1- |

**Table 4-23: Serial Port Connector (RS-422/485) Pinouts**


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### 4.2.21 SPDIF Connector

**CN Label:** CN5

**CN Type:** 5-pin header

**CN Location:** See Figure 4-22

**CN Pinouts:** See Table 4-24

Use the SPDIF connector to connect digital audio devices to the system.

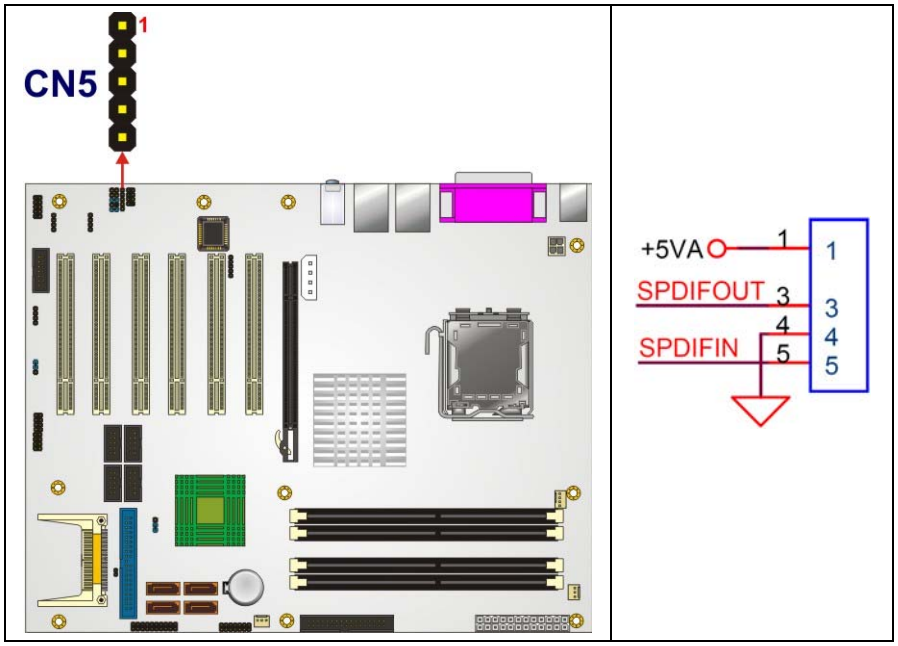


**Figure 4-22: SPDIF Connector Pinout Locations**

| PIN | DESCRIPTION |
|---|---|
| 1 | VCC AUDIO |
| 2 | NC |
| 3 | SPDIF OUT |
| 4 | GND AUDIO |
| 5 | SPDIF IN |

**Table 4-24: SPDIF Connector Pinouts**

### 4.2.22 TPM Connector

**CN Label:** TPM1

**CN Type:** 20-pin header (2x10)

**CN Location:** See Figure 4-23

**CN Pinouts:** See Table 4-25

Use the TPM connector to connect a TPM module to the system.

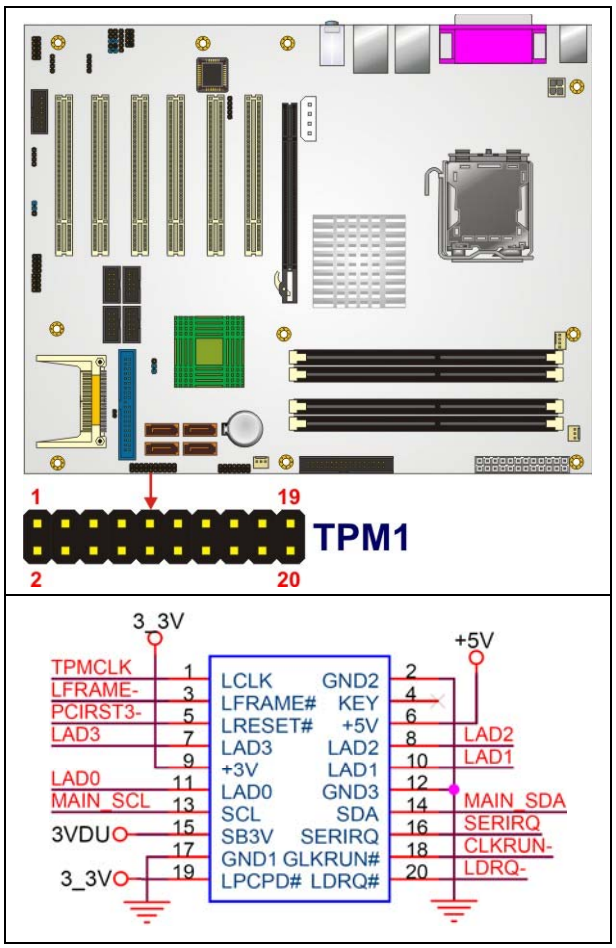


**Figure 4-23: TPM Connector Pinout Locations**


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| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | LCLK | 2 | GND |
| 3 | LFRAME# | 4 | KEY |
| 5 | LRESET# | 6 | +5V |
| 7 | LAD3 | 8 | LAD2 |
| 9 | +3V | 10 | LAD1 |
| 11 | LAD0 | 12 | GND |
| 13 | SCL | 14 | SDA |
| 15 | SB3V | 16 | SERIRQ |
| 17 | GND | 18 | GLKRUN# |
| 19 | LPCPD# | 20 | LDRQ# |

**Table 4-25: TPM Connector Pinouts**

### 4.2.23 USB Connectors (Internal)

**CN Label:** USB3, USB4

**CN Type:** 8-pin header (2x4)

**CN Location:** See Figure 4-24

**CN Pinouts:** See Table 4-26

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

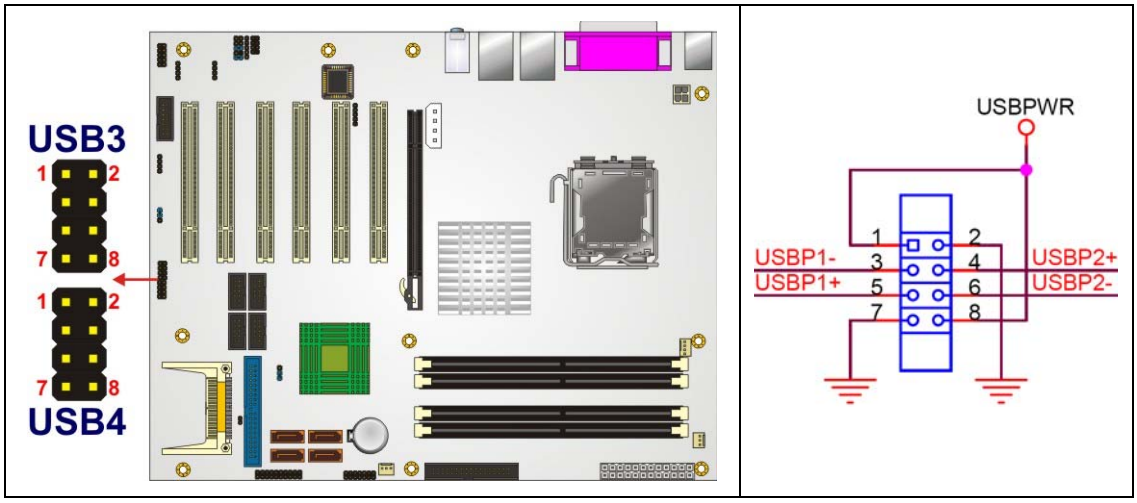


**Figure 4-24: USB Connector Pinout Locations**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | PWR (+5V) | 2 | GND |
| 3 | USBPB- | 4 | USBPB+ |
| 5 | USBPA+ | 6 | USBPB- |
| 7 | GND | 8 | PWR (+5V) |

**Table 4-26: USB Port Connector Pinouts**


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## 4.3 External Peripheral Interface Connectors

The external peripheral interface connectors on the back panel are connected to devices externally when the MXGA is installed in a chassis. The peripheral connectors on the rear panel are:

- 1 x Keyboard/mouse connector
- 1 x Parallel port connector
- 2 x RJ-45 Ethernet connector
- 3 x Audio jacks
- 4 x USB 2.0 connectors
- 1 x VGA connector
- 1 x Serial port connector

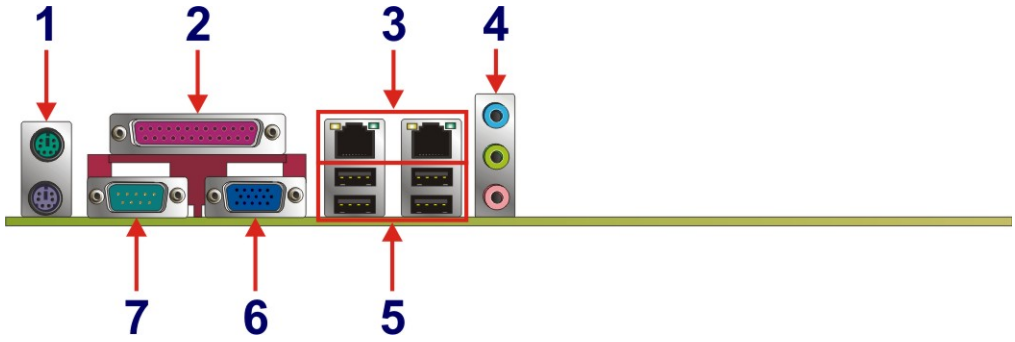


**Figure 4-25: MXGA External Interface Connectors**

### 4.3.1 Keyboard/Mouse Connector

CN Label: KBMS1

CN Type: PS/2 connector

CN Location: See Figure 4-25 (labeled number 1)

CN Pinouts: See Figure 4-26 and Table 4-27

The MXGA keyboard and mouse connectors are standard PS/2 connectors.

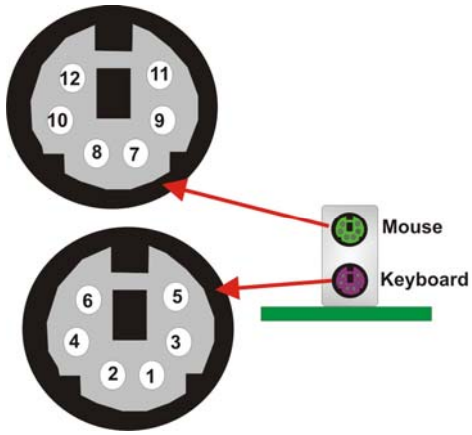


**Figure 4-26: PS/2 Pinouts**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | L_KDAT | 7 | L_MDAT |
| 2 | NC | 8 | NC |
| 3 | GND | 9 | GND |
| 4 | 5V | 10 | 5V |
| 5 | L_KCLK | 11 | L_MCLK |
| 6 | NC | 12 | NC |

**Table 4-27: PS/2 Connector Pinouts**


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### 4.3.2 Parallel Port Connector

CN Label: 3IN1_DSUB1A

CN Type: DB-25

CN Location: See Figure 4-25 (labeled number 2)

CN Pinouts: See Figure 4-27 and Table 4-28

These ports are usually connected to a printer. MXGA includes one on-board parallel ports accessed through one 25-pin D-type female connector.

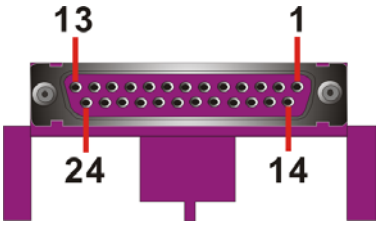


**Figure 4-27: Parallel Port Connector Pinout Locations**

| PIN | Description | PIN | Description |
|---|---|---|---|
| 1 | STROBE# | 2 | DATA 0 |
| 3 | DATA 1 | 4 | DATA 2 |
| 5 | DATA 3 | 6 | DATA 4 |
| 7 | DATA 5 | 8 | DATA 6 |
| 9 | DATA 7 | 10 | ACKNOWLEDGE |
| 11 | BUSY | 12 | PAPER EMPTY |
| 13 | PRINTER SELECT | 14 | AUTO FORM FEED # |
| 15 | ERROR# | 16 | INITIALIZE |
| 17 | PRINTER SELECT LN# | 18 | GND |
| 19 | GND | 20 | GND |
| 21 | GND | 22 | GND |
| 23 | GND | 24 | GND |
| 25 | GND | | |

**Table 4-28: Parallel Port Connector Pinouts**

### 4.3.3 Ethernet Connector

CN Label: LAN/USB1B, LAN/USB2B

CN Type: RJ-45 ports

CN Location: See Figure 4-25 (labeled 3)

CN Pinouts: See Figure 4-28, **Table** 4-29 and **Table 4-30**

A 1Gb connection can be made between the Ethernet connectors and a Local Area Network (LAN) through a network hub.

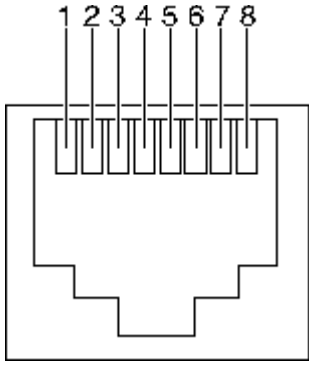


**Figure 4-28: Ethernet Connector Pinout Locations**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | TX+ (or MDX0+) | 5 | N/C (or MDX2-) |
| 2 | TX- (or MDX0-) | 6 | RX- (or MDX1-) |
| 3 | RX+ (or MDX1+) | 7 | N/C (or MDX3+) |
| 4 | N/C (or MDX2+) | 8 | N/C (or MDX3-) |
| 13 | MDX0+ | 17 | MDX2- |
| 14 | MDX0- | 18 | MDX1- |
| 15 | MDX1+ | 19 | MDX3+ |
| 16 | MDX2+ | 20 | MDX3- |
| 1 | TX+ (or MDX0+) | 5 | N/C (or MDX2-) |
| 2 | TX- (or MDX0-) | 6 | RX- (or MDX1-) |

**Table 4-29: Ethernet Connector Pinouts**


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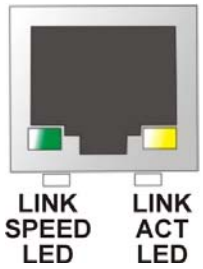


**Figure 4-29: Ethernet Connector**

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked (**Table 4-30**).

| SPEED LED | | LINK LED | |
|---|---|---|---|
| **Status** | **Description** | **Status** | **Description** |
| GREEN | ON: 100MB<br>OFF: 10MB | YELLOW | ON: Linked<br>Flashing: Activity |

**Table 4-30: Ethernet Connector LEDs**

### 4.3.4 Audio Connectors

CN Label: CN6

CN Type: Audio jack

CN Location: See Figure 4-25 (labeled number 4)

CN Pinouts: See Figure 4-30

- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Speaker Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.
- **Microphone (Pink):** Connects a microphone.

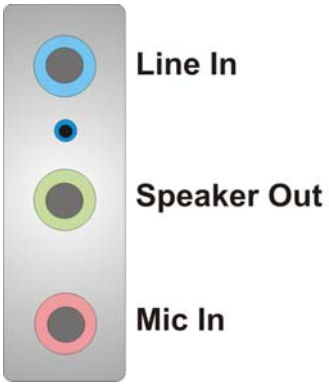


**Figure 4-30: Audio Connector**

### 4.3.5 USB Connectors

CN Label: LAN/USB1B, LAN/USB2B

CN Type: Dual USB port

CN Location: See Figure 4-25 (labeled 5)

CN Pinouts: See Figure 4-31 and Table 4-31

USB devices connect directly to the USB connectors on the external peripheral connector panel.

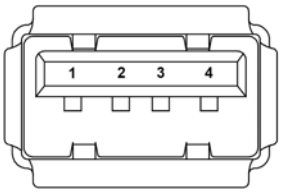


**Figure 4-31: USB Connector Pinout Locations**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|---|---|---|---|
| 1 | VCC | 5 | VCC |
| 2 | USBD0- | 6 | USBD0- |
| 3 | USBD0+ | 7 | USBD0+ |
| 4 | GND | 8 | GND |

**Table 4-31: USB Connector Pinouts**


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### 4.3.6 VGA Connector

CN Label: 3IN1_DSUB1C

CN Type: HD-D-sub 15 Female connector

CN Location: See Figure 4-25 (labeled 6)

CN Pinouts: See **Figure 4-32** and **Table 4-32**

The standard HD-D-sub 15 female connector connects to a CRT or LCD monitor.

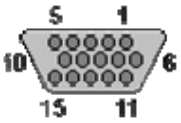


**Figure 4-32: VGA Connector**

| PIN | Description | PIN | Description |
|---|---|---|---|
| 1 | RED | 2 | GREEN |
| 3 | BLUE | 4 | N/C |
| 5 | GND | 6 | GND |
| 7 | GND | 8 | GND |
| 9 | VCC | 10 | GND |
| 11 | N/C | 12 | DDC DAT |
| 13 | HSYNC | 14 | VSYNC |
| 15 | DDC CLK | | |

**Table 4-32: VGA Connector Pinouts**

### 4.3.7 Serial Communications Connector

CN Label: 3IN1_DSUB1B

CN Type: D-sub 9 Male connector

CN Location: See Figure 4-25 (labeled 7)

CN Pinouts: See **Figure 4-33** and **Table 4-33**

The serial connector on the external interface panel provides serial connection in the RS-232 mode.

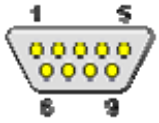


**Figure 4-33: Serial Communications Connector Pinout Locations**

| PIN | DESCRIPTION |
|---|---|
| 1 | DATA CARRIER DETECT (DCD) |
| 2 | RECEIVE DATA (RXD) |
| 3 | TRANSMIT DATA (TXD) |
| 4 | DATA TERMINAL READY (DTR) |
| 5 | GROUND (GND) |
| 6 | DATA SET READY (DSR) |
| 7 | REQUEST TO SEND (RTS) |
| 8 | CLEAR TO SEND (CTS) |
| 9 | RING INDICATOR (RI) |

**Table 4-33: COM1 RS-232 Mode Connector Pinouts**

## 4.4 On-board Jumpers

The MXGA has fifteen on-board jumpers. Refer to **Section 5.4** for jumper configuration settings.


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Chapter

5

# Installation


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## 5.1 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the installation of the MXGA may result in permanent damage to the MXGA and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the MXGA. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the MXGA, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board, touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the MXGA, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the PCB***: When handling the PCB, hold it by its edges.

## 5.2 Installation Considerations

**NOTE:**

The following installation notices and installation considerations should be read and understood before the MXGA is installed. All installation notices pertaining to the installation of the MXGA should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the MXGA and injury to the person installing the motherboard.

### 5.2.1 Installation Notices

**WARNING:**

The installation instructions described in this manual should be carefully followed in order to prevent damage to the MXGA and injury to the user.

Before and during the installation please DO the following:

- **Read the user manual**:
  - The user manual provides a complete description of the MXGA installation instructions and configuration options.
- **Wear an electrostatic discharge cuff (ESD)**:
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- **Place the MXGA on an antistatic pad**:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn off all power to the MXGA**:


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- When working with the MXGA, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the MXGA **DO NOT**:

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

### 5.2.2 Installation Checklist

The following checklist is provided to ensure the MXGA is properly installed.

- All the items in the packing list are present (see **Chapter 3**)
- A CPU is installed
- A CPU cooling kit is properly installed
- Compatible memory modules are properly inserted into the memory slots
- The MXGA is installed into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices (if applicable) are properly connected
  - IDE devices
  - SATA drives
  - Floppy disk drive
  - System front panel connector
  - Audio kit
  - Power supply
  - USB cable
  - Serial port cable
  - Parallel port cable
  - Keyboard/mouse cable
  - COM port cables
- The following external peripheral devices (if applicable) are properly connected to the chassis:

- VGA screen
- Keyboard
- Mouse
- USB devices
- LAN
- Audio jacks

## 5.3 CPU, CPU Cooling Kit and DIMM Installation

**WARNING:**

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the MXGA. If any of these components is not installed, the MXGA cannot operate.

### 5.3.1 LGA775 CPU Installation

**NOTE:**

Enabling Hyper-Threading Technology on the system requires meeting all of the platform requirements listed below:

- **CPU**: An Intel® Pentium 4 Processor (or better) with HT Technology must be installed
- **Chipset**: An Intel® Chipset that supports HT Technology
- **OS**: An operating system that has optimizations for HT Technology


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**WARNING:**

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

The LGA775 is shown in Figure 5-1.

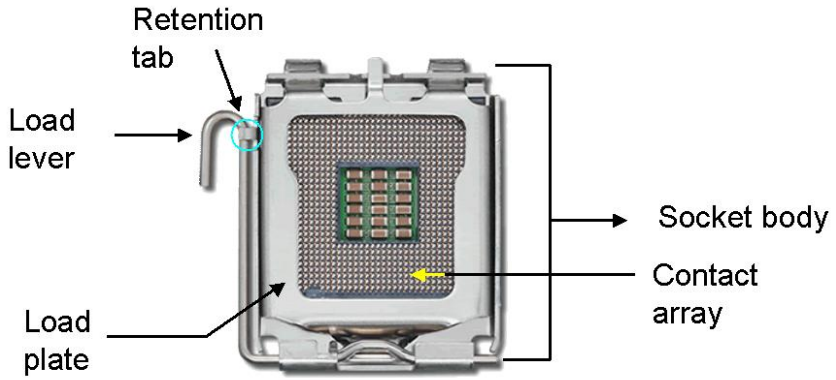


**Figure 5-1: Intel LGA775**

To install a LGA775 CPU onto the MXGA, follow the steps below:

**WARNING:**

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

**Step 1:** **Remove the protective cover.** Remove the black protective cover by prying it off the load plate. To remove the protective cover, locate the "**REMOVE**" sign and use your fingernail to pry the protective cover off. See Figure 5-2.

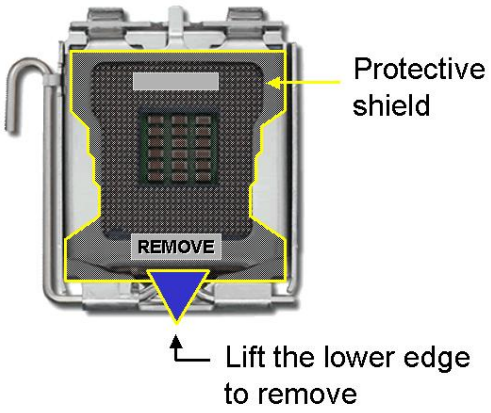


**Figure 5-2: Remove the CPU Socket Protective Shield**

**Step 2:** **Open the socket**. Disengage the load lever by pressing the lever down and slightly outward to clear the retention tab. Rotate the load lever to a fully open position. Then rotate the load plate towards the opposite direction. See Figure 5-3.

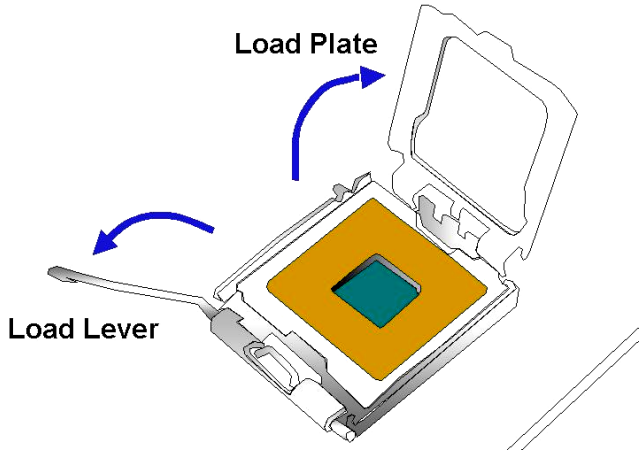


**Figure 5-3: Open the CPU Socket Load Plate**

**Step 3:** **Inspect the CPU socket** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.


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**Step 4:** **Orientate the CPU properly**. Make sure the IHS (Integrated Heat Sink) side is facing upward.

**Step 5:** **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.

**Step 6:** **Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

**Step 7:** **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See Figure 5-4.

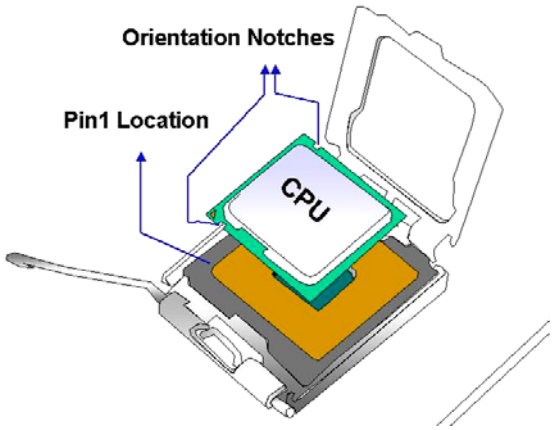


**Figure 5-4: Insert the LGA775 CPU**

**Step 8:** **Close the CPU socket.** Close the load plate and engage the load lever by pushing it back to its original position. Secure the load lever under the retention tab on the side of CPU socket.

**Step 9:** **Connect the CPU 12V cable to the 12After the cooling kit is installed** connect the CPU cable to the CPU 12V power connector

### 5.3.2 LGA775 Cooling Kit Installation

**WARNING:**

**It is strongly recommended that the original heat sink and cooler provided by Intel not be used on the MXGA.**

CyberResearch's cooling kits include a support bracket that is combined with the heat sink mounted on the CPU to counterweigh and balance the load on both sides of the PCB.

**Figure 5-5: Cooling Kits**

The LGA775 CPU cooling kits shown in Figure 5-5 can be purchased separately. The cooling kits comprise of a CPU heat sink and a cooling fan.

**WARNING:**

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

Follow the instructions below to install a cooling kit.


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**Step 1:** **Place the cooling kit onto the LGA775 CPU**. Make sure the CPU cable can be properly routed when the cooling kit is installed.

**Step 2:** **Properly align the cooling kit**. Make sure the four spring screw fasteners can pass through the pre-drilled holes on the PCB.

**Step 3:** **Mount the cooling kit**. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the predrilled holes on the bottom of the PCB.

**Step 4:** **Secure the cooling kit**. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See Figure 5-6)

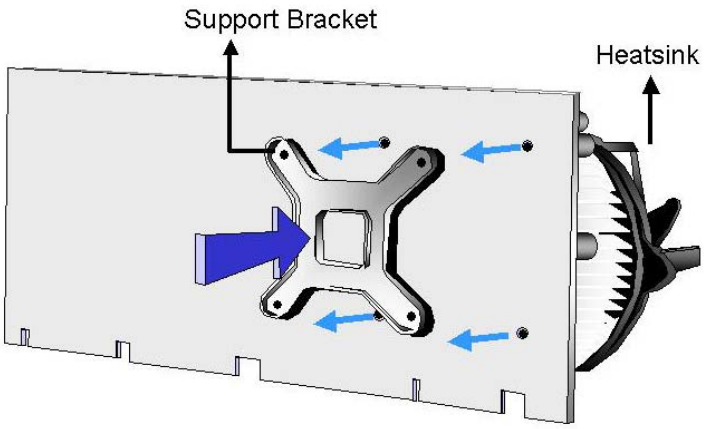


**Figure 5-6: Securing the Heat sink to the PCB Board**

**Step 5:** **Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

**Step 6:** **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the MXGA. Carefully route the cable and avoid heat generating chips and fan blades.

### 5.3.3 DIMM Installation

**WARNING:**

Using incorrectly specified DIMM may cause permanently damage the MXGA. Please make sure the purchased DIMM complies with the memory specifications of the MXGA. DIMM specifications compliant with the MXGA are listed in **Chapter 2**.

To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 5-7**.

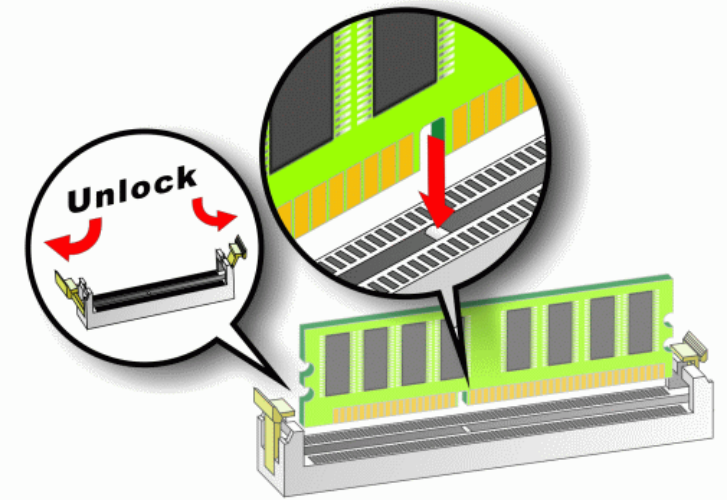


**Figure 5-7: Installing a DIMM**

**Step 1:** **Open the DIMM socket handles**. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 5-7**.

**Step 2:** **Align the DIMM with the socket**. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See **Figure 5-7**.


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**Step 3:** **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-7**.

**Step 4:** **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

## 5.4 Jumper Settings

**NOTE:**

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

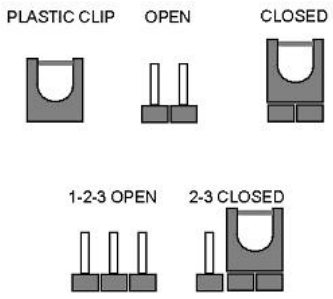


**Figure 5-8: Jumper Locations**

Before the MXGA is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the MXGA are listed in Table 5-1.

| Description | Label | Type |
|---|---|---|
| CF Master/Slave Selection | JP2 | 2-pin header |
| Clear CMOS | JP1 | 3-pin header |
| COM2 Mode Selection | JP4 | 3-pin header |

**Table 5-1: Jumpers**

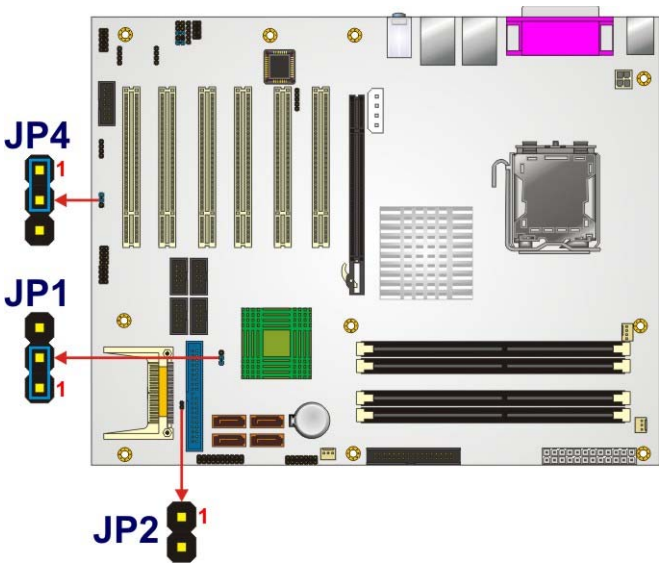


**Figure 5-9: Jumper Locations**

### 5.4.1 CF Master/Slave Selection

**Jumper Label:** **JP2**

**Jumper Type:** 2-pin header

**Jumper Settings:** See **Table 5-2**

**Jumper Location:** See Figure 5-9

The CF Master/Slave Selection jumper sets the CF Type I card or CF Type II cards as either the slave device or the master device. CF Master/Slave Selection jumper settings are shown in **Table 5-2**.

| Pins | Description | |
|---|---|---|
| Open | Slave | Default |
| Short | Master | |

**Table 5-2: CF Master/Slave Selection Settings**


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### 5.4.2 Clear CMOS Jumper

**Jumper Label:** JP1

**Jumper Type:** 3-pin header

**Jumper Settings:** See Table 5-3

**Jumper Location:** See Figure 5-9

If the MXGA fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the "CMOS Settings Wrong" message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in Table 5-3.

| Pins | Description | |
|---|---|---|
| Short 1 - 2 | Keep CMOS Setup | Default |
| Short 2 – 3 | Clear CMOS Setup | |

**Table 5-3: Clear CMOS Jumper Settings**

### 5.4.3 COM2 Mode Selection

**Jumper Label:** **JP4**

**Jumper Type:** 3-pin header

**Jumper Settings:** See **Table 5-4**

**Jumper Location:** See Figure 5-9

The COM2 Mode Selection jumper sets the communication protocol used by the second serial communications port (COM 2) as RS-232, RS-422 or RS-485. The COM2 Mode Selection settings are shown in Table 5-4.

| Pins | Description | |
|---|---|---|
| Short 1-3 | RS-232 | Default |
| Short 3-5 | RS-422/485 | |

**Table 5-4: COM2 Mode Selection Jumper Settings**

## 5.5 Chassis Installation

### 5.5.1 Airflow

**WARNING**

Airflow is critical to the cooling of the CPU and other onboard components. The chassis into which the MXGA is placed must have air vents to allow proper airflow to cool the system components.

The MXGA must be installed in a chassis with ventilation holes on the sides allowing airflow to travel over the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow over the board surface.


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**NOTE**

CyberResearch has a wide range of chassis available. Please contact CyberResearch, Inc. via phone (203) 643-5000 or email: *sales@cyberresearch.com*.or visit our website : www.cyberresearch.com

## 5.6 Internal Peripheral Device Connections

### 5.6.1 Peripheral Device Cables

The cables listed in Table 5-5 are shipped with the MXGA.

| Quantity | Type |
|---|---|
| 1 | ATA 66/100 flat cable |
| 2 | Dual RS-232 cables |
| 2 | SATA drive cables |
| 1 | SATA drive power cable |

**Table 5-5: Provided Cables**

### 5.6.2 ATA Flat Cable Connection

The ATA 66/100 flat cable connects to an IDE device. Follow the instructions below to connect an IDE HDD to the MXGA.

**Step 1:** **Locate the IDE connector**. The locations of the IDE device connectors are shown in **Chapter 3**.

**Step 2:** **Insert the connector**. Connect the IDE cable connector to the onboard connector. See **Figure 5-10**. A key on the front of the cable connector ensures it can only be inserted in one direction.

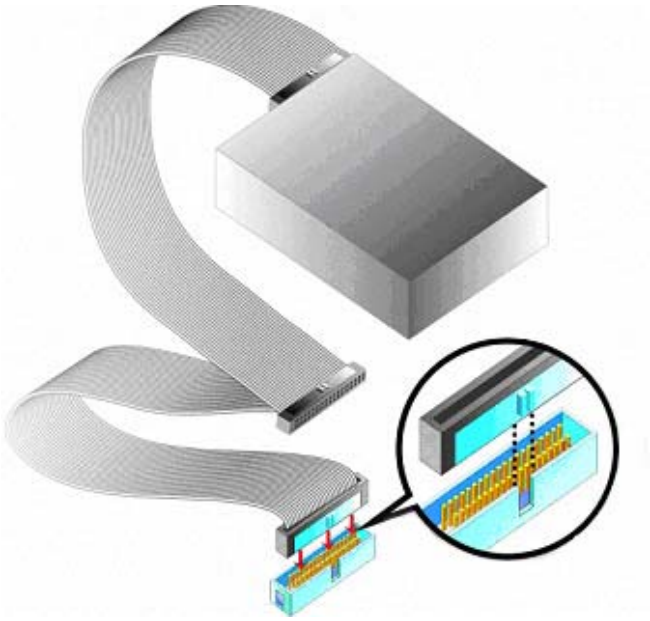

**Figure 5-10: IDE Cable Connection**

**Step 3:** **Connect the cable to an IDE device**. Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector

### 5.6.3 Dual RS-232 Cable Connection

The dual RS-232 cable consists of two serial port connectors attached to a serial communications cable that is then attached to two bracket mounted D-sub 9 male connectors. To install the dual RS-232 cable, please follow the steps below.

**Step 1:** **Locate the connector**. The location of the RS-232 connector is shown in **Chapter 3**.

**Step 2:** **Insert the cable connector**. Insert the connectors into the serial port box headers. See **Figure 5-11**. A key on the front of the cable connectors ensures the connectors can only be installed in one direction.


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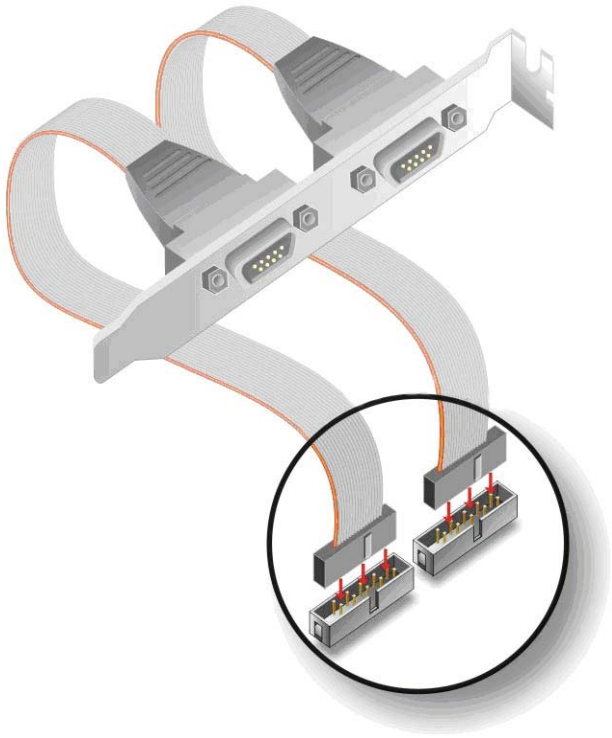

**Figure 5-11: Dual RS-232 Cable Installation**

**Step 3:** **Secure the bracket**. The dual RS-232 connector has two D-sub 9 male connectors secured to a bracket. To secure the bracket to a chassis please refer to the reference material that came with the chassis

### 5.6.4 SATA Drive Connection

The MXGA is shipped with SATA drive cables and SATA drive power cable. Follow the steps below to connect the SATA drives to the motherboard.

**Step 1:** **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

**Step 2:** **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-12**.

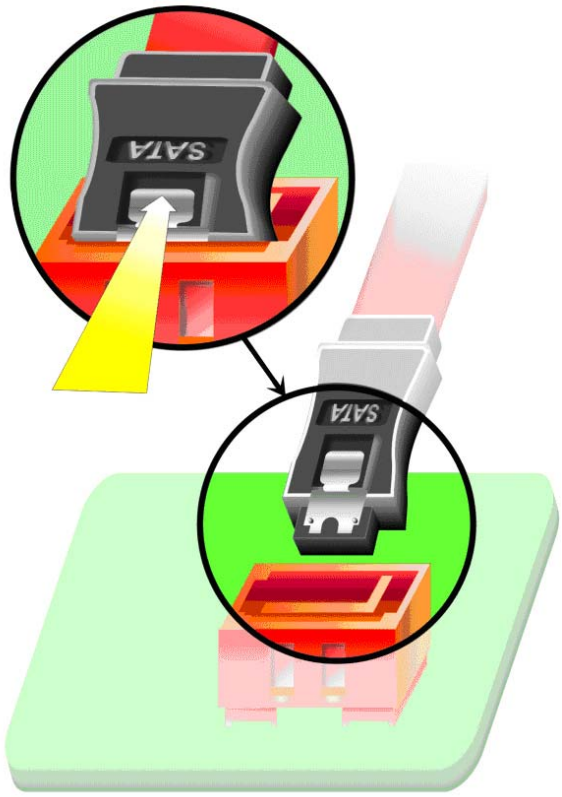


**Figure 5-12: SATA Drive Cable Connection**

**Step 3:** **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 5-13**.

**Step 4:** **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-13**.


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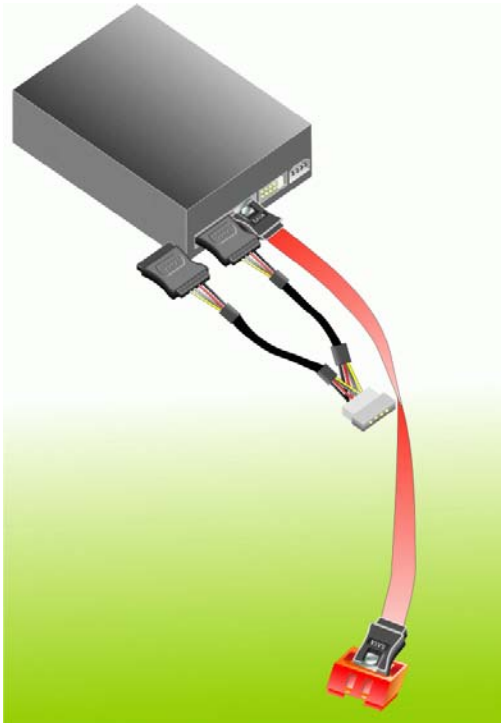

**Figure 5-13: SATA Power Drive Connection**

## 5.7 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Mouse and keyboard
- Parallel devices
- RJ-45 Ethernet cable connectors
- USB devices
- Audio devices
- VGA monitor
- Serial devices

To install these devices, connect the corresponding cable connector from the actual device to the corresponding MXGA external peripheral interface connector making sure the pins are properly aligned.

### 5.7.1 PS/2 Keyboard/Mouse Connection

The MXGA has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the MXGA.

**Step 1:** **Locate the dual PS/2 connector**. The location of the dual PS/2 connector is shown in **Chapter 3**.

**Step 2:** **Insert the keyboard/mouse connector**. Insert a PS/2 keyboard or mouse connector into the appropriate PS/2 connector on the external peripheral interface connector. See **Figure 5-14**.

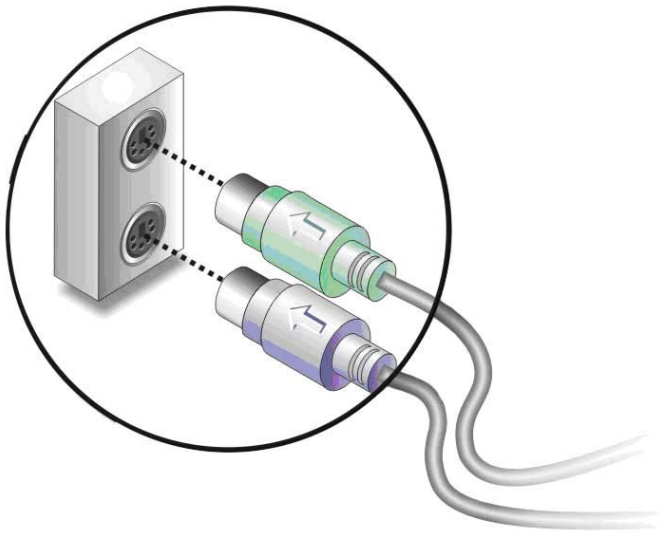

**Figure 5-14: PS/2 Keyboard/Mouse Connector**


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### 5.7.2 Parallel Device Connection

The MXGA has a single female DB-25 connector on the external peripheral interface panel for parallel devices. Follow the steps below to connect a parallel device to the MXGA.

**Step 1:** **Locate the DB-25 connector**. The location of the DB-25 connector is shown in **Chapter 3**.

**Step 2:** **Insert the DB-25 connector**. Insert the DB-25 connector of a parallel device into the DB-25 connector on the external peripheral interface. See Figure 5-15.

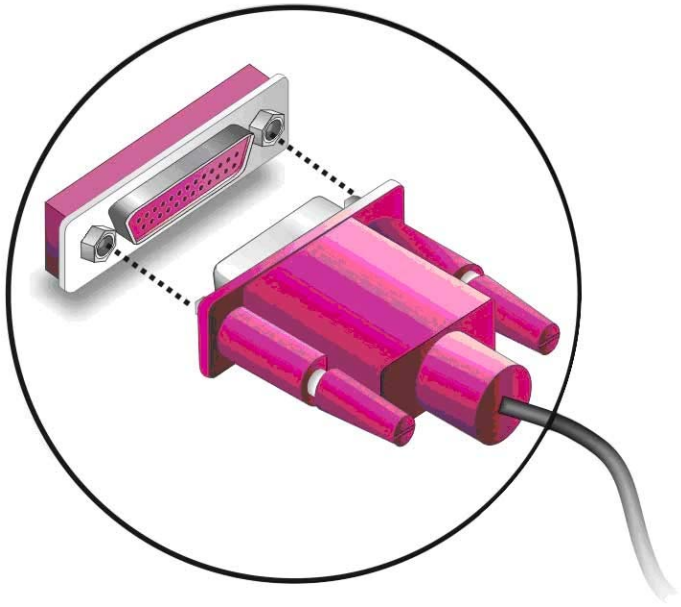

**Figure 5-15: Parallel Device Connector**

**Step 3:** **Secure the connector**. Secure the DB-25 connector to the external interface by tightening the two retention screws on either side of the connector.

### 5.7.3 RJ-45 Ethernet Connection

The MXGA has two RJ-45 Ethernet connectors on the external peripheral interface panel for LAN communications. Follow the steps below to connect an RJ-45 Ethernet connector to the MXGA.

**Step 1:** **Locate the RJ-45 connector**. The location of the RJ-45 connector is shown in **Chapter 3**.

**Step 2:** **Insert an RJ-45 plug**. Insert the RJ-45 plug of a LAN into the RJ-45 receptacle on the external peripheral interface. See Figure 5-16.

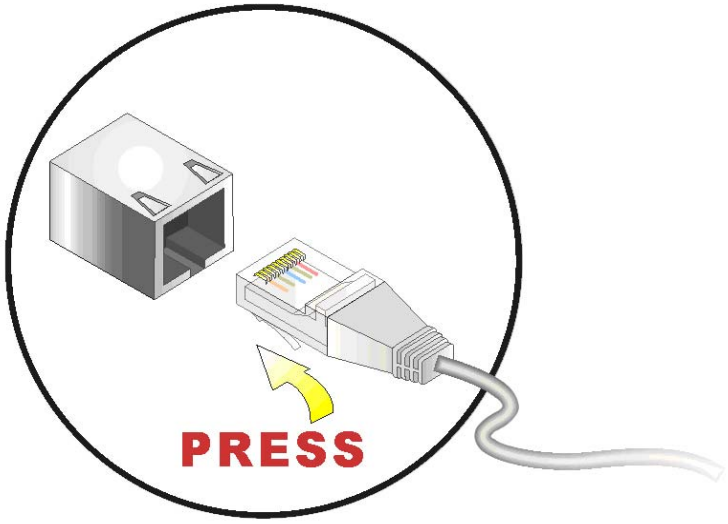


**Figure 5-16: RJ-45 Ethernet Connector**


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### 5.7.4 USB Connection

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the MXGA.

**Step 1:** **Locate the USB Series "A" receptacle connectors**. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

**Step 2:** **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface.
See Figure 5-17.

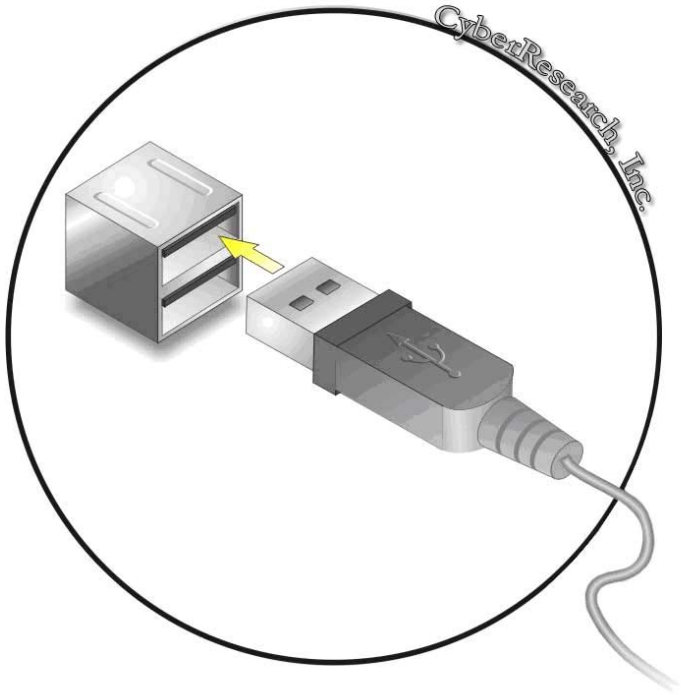


**Figure 5-17: USB Connector**

### 5.7.5 Audio Connection

Audio signals are interfaced through three phone jack connections. The red phone jack is for Mic In, blue is for Line In and green is for Speaker Out. Follow the steps below to connect audio devices to the MXGA.

**Step 1:** **Locate the audio phone jacks**. The location of the audio phone jacks are shown in **Chapter 3**.

**Step 2:** **Insert audio phone jack plugs**. Insert audio phone jack plugs into the audio phone jacks on the external peripheral interface. See Figure 5-18.

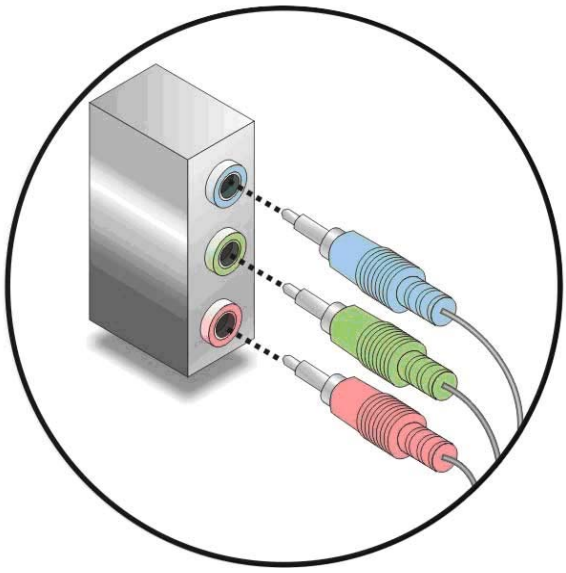

**Figure 5-18: Audio Connectors**


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### 5.7.6 VGA Monitor Connection

The MXGA has a single female DB-15 connector on the external peripheral interface panel for a VGA monitor. Follow the steps below to connect a VGA monitor to the MXGA.

**Step 1:** **Locate the DB-15 connector**. The location of the DB-15 connector is shown in **Chapter 3**.

**Step 2:** **Insert the VGA connector**. Insert the DB-15 connector of a VGA monitor into the DB-15 connector on the external peripheral interface. See **Figure 5-19**.

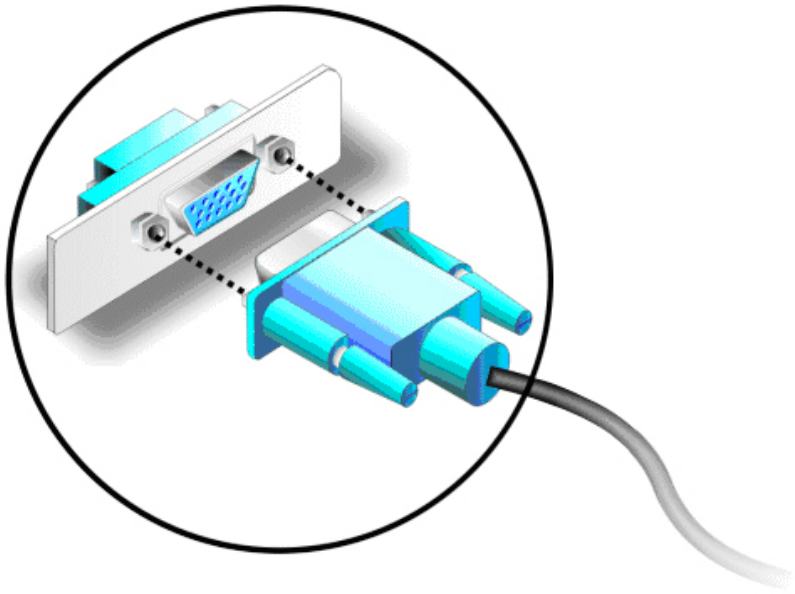

**Figure 5-19: VGA Connector**

**Step 3:** **Secure the connector**. Secure the VGA connector to the external interface by tightening the two retention screws on either side of the connector.

### 5.7.7 Serial Device Connection

The MXGA has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the MXGA.

**Step 1:** **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 3**.

**Step 2:** **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 5-20.

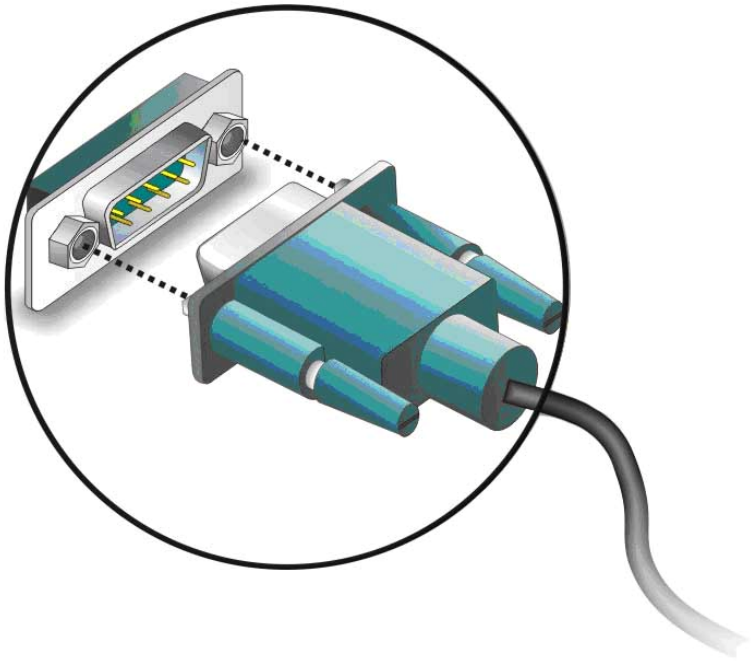

**Figure 5-20: Serial Device Connector**

**Step 3:** **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.


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Chapter

6

# AMI BIOS


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# 6.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

## 6.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the DELETE key is pressed, restart the computer and try again.

## 6.1.2 Using Setup

Use the arrow keys to highlight items, press ENTER to select, use the PageUp and PageDown keys to change entries, press F1 for help and press ESC to quit. Navigation keys are shown in.

| Key | Function |
|---|---|
| Up arrow | Move to previous item |
| Down arrow | Move to next item |
| Left arrow | Move to the item on the left hand side |
| Right arrow | Move to the item on the right hand side |
| Esc key | Main Menu – Quit and not save changes into CMOS<br>Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu |
| Page Up key | Increase the numeric value or make changes |
| Page Dn key | Decrease the numeric value or make changes |

| Key | Function |
|---|---|
| F1 key | General help, only for Status Page Setup Menu and Option Page Setup Menu |
| F2 /F3 key | Change color from total 16 colors.<br>F2 to select color forward. |
| F10 key | Save all the CMOS changes, only for Main Menu |

**Table 6-1: BIOS Navigation Keys**

### 6.1.3 Getting Help

When F1 is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press ESC or the F1 key again.

### 6.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Section 5.4**.

### 6.1.5 BIOS Menu Bar

The menu bar on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.


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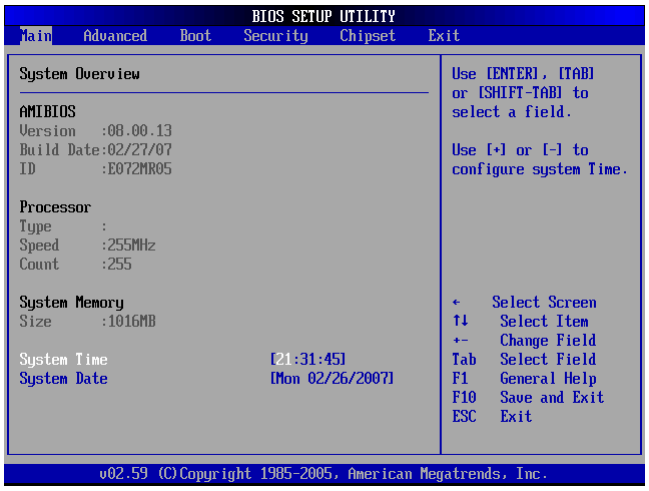
## 6.2 Main

The Main BIOS menu (BIOS Menu 1) appears when the BIOS Setup program is entered. The Main menu gives an overview of the basic system information.




**BIOS Menu 1: Main**

### ➔ System Overview

The System Overview lists a brief summary of different system components. The fields in System Overview cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications
  - **Type**: Names the currently installed processor
  - **Speed**: Lists the processor speed
  - **Count**: The number of CPUs on the motherboard
- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

**The System Overview field also has two user configurable fields:**

➔ **System Time [xx:xx:xx]**

Use the System Time option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the System Date option to set the system date. Manually enter the day, month and year.

## 6.3 Advanced

Use the Advanced menu (BIOS Menu 2) to configure the CPU and peripheral devices through the following sub-menus:

**WARNING:**

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

- **CPU Configuration** (see **Section 6.3.1**)
- **IDE Configuration** (see **Section 6.3.2**)
- **Floppy Configuration** (see **Section 6.3.3**)
- **SuperIO Configuration** (see **Section 6.3.4**)
- **Hardware Health Configuration** (see **Section 6.3.5**)
- **ACPI Configuration** (see **Section 6.3.6**)
- **AMP Configuration** (see **Section 6.3.7**)
- **ASF Configuration** (see **Section 6.3.8**)
- **MPS Configuration** (see **Section 6.3.9**)
- **Trusted Computing** (see **Section 6.3.10**)
- USB Configuration (see **Section 6.3.11**)

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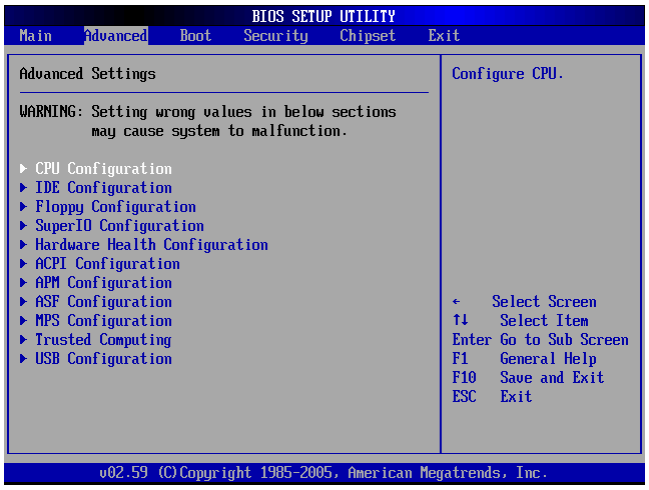
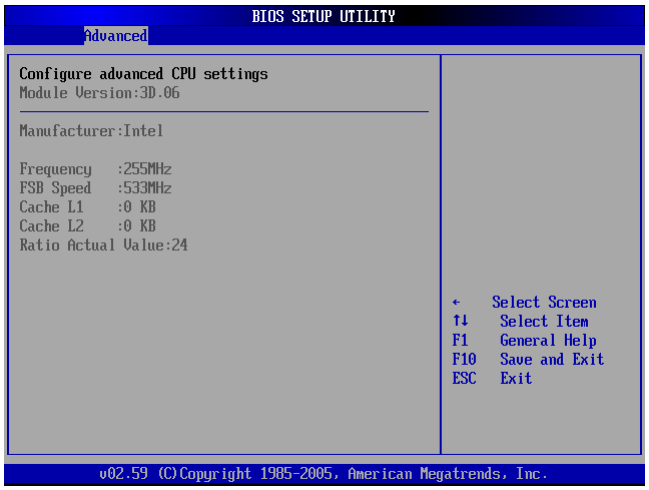



**BIOS Menu 2: Advanced**

## 6.3.1 CPU Configuration

Use the CPU Configuration menu (BIOS Menu 3) to view detailed CPU specifications and configure the CPU.




**BIOS Menu 3: CPU Configuration**

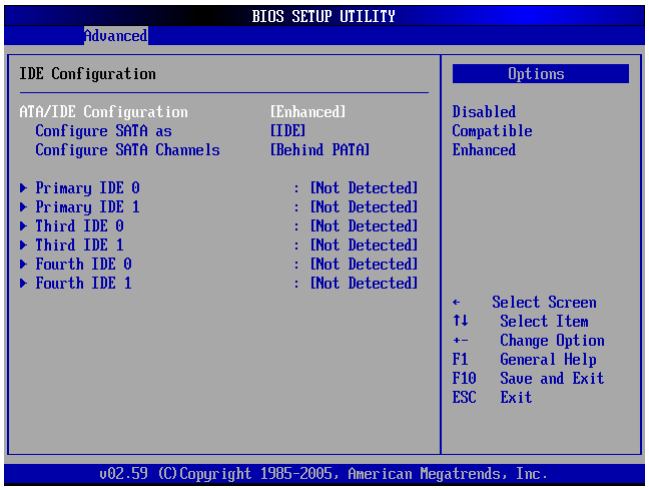
The CPU Configuration menu (BIOS Menu 3) lists the following CPU details:

- **Module Version**: xx.xx
- **Manufacturer**: Lists the name of the CPU manufacturer
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed

- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size
- **Ratio Actual Value**: Displays the ratio at which the CPU is actually operating

### 6.3.2 IDE Configuration

Use the IDE Configuration menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.




**BIOS Menu 4: IDE Configuration**

➔ **ATA/IDE Configurations [Compatible]**

Use the **ATA/IDE Configurations** option to configure the ATA/IDE controller.

➔ **Disabled** Disables the on-board ATA/IDE controller.

➔ **Compatible** Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

➔ **Enhanced** **DEFAULT** Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6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storage devices. Some legacy OS do not support this mode.

➔ **Configure SATA as [IDE]**

Use the **Configure SATA as** option to configure SATA devices as normal IDE devices.

➔ **IDE** **DEFAULT** Configures SATA devices as normal IDE device.

➔ **Configure SATA Channels [Behind PATA]**

Use the **Configure SATA Channels** option to determine how SATA channels and PATA channels are ordered.

➔ **Before PATA** Puts SATA channels before PATA channels.

➔ **Behind PATA** **DEFAULT** Puts SATA channels behind PATA channels.

➔ **IDE 0 (Master) and IDE 1 (Slave)**

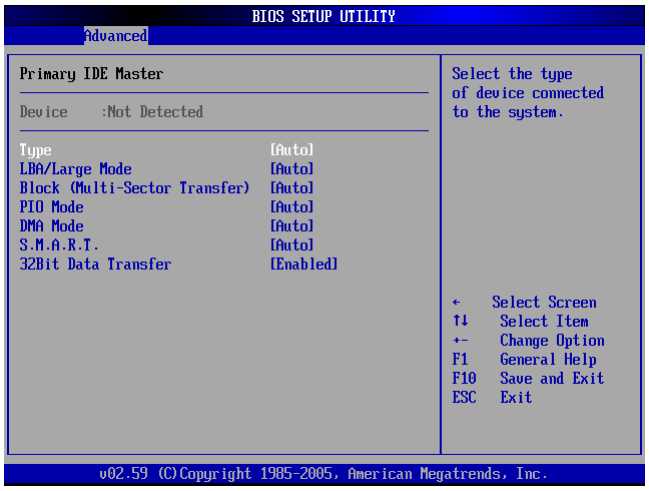
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the IDE Configuration menu:

- Primary IDE 0 (Master)
- Primary IDE 1 (Slave)
- Third IDE 0 (Master)
- Third IDE 1 (Slave)
- Fourth IDE 0 (Master)
- Fourth IDE 1 (Slave)

The IDE Configuration menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 6.3.2.1** appear.

### 6.3.2.1 IDE Master, IDE Slave

Use the IDE Master and IDE Slave configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.




**BIOS Menu 5: IDE Master and IDE Slave Configuration**

➔ **Auto-Detected Drive Parameters**

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode**: Indicates the PIO mode of the installed device.
- **DMA Mode**: Adjust the DMA mode options.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.

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- **32Bit Data Transfer**: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the Type BIOS option to select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed** BIOS is prevented from searching for an IDE disk drive on the specified channel.

➔ **Auto** **DEFAULT** The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.

➔ **CD/DVD** The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.

➔ **ARMD** This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

- ➔ **ZIP**
- ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the LBA/Large Mode option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled** BIOS is prevented from using the LBA mode control on the specified channel.

➔ **Auto** **DEFAULT** BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the Block (Multi Sector Transfer) to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled** BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.

➔ **Auto** **DEFAULT** BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the PIO Mode option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto** **DEFAULT** BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

➔ **0** PIO mode 0 selected with a maximum transfer rate of 3.3MBps

➔ **1** PIO mode 1 selected with a maximum transfer rate of 5.2MBps

➔ **2** PIO mode 2 selected with a maximum transfer rate of 8.3MBps

➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1MBps


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➔ **4** PIO mode 4 selected with a maximum transfer rate of 16.6MBps

(This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the DMA Mode BIOS selection to adjust the DMA mode options.

➔ **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.

➔ **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps

➔ **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps

➔ **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps

➔ **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps

➔ **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps

➔ **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps

➔ **UDMA1** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps

➔ **UDMA1** Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps

- ➔ **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
- ➔ **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- ➔ **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
- ➔ **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the S.M.A.R.T option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. S.M.A.R.T predicts impending drive failures. The S.M.A.R.T BIOS option enables or disables this function.

- ➔ **Auto** **DEFAULT** BIOS auto detects HDD SMART support.
- ➔ **Disabled** Prevents BIOS from using the HDD SMART feature.
- ➔ **Enabled** Allows BIOS to use the HDD SMART feature

➔ **32Bit Data Transfer [Enabled]**

Use the 32Bit Data Transfer BIOS option to enables or disable 32-bit data transfers.

- ➔ **Disabled** Prevents the BIOS from using 32-bit data transfers.
- ➔ **Enabled** **DEFAULT** Allows BIOS to use 32-bit data transfers on supported hard disk drives.


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### 6.3.3 Floppy Configuration

Use the Floppy Configuration menu to configure the floppy disk drive connected to the system.

**BIOS Menu 6: Floppy Configuration**

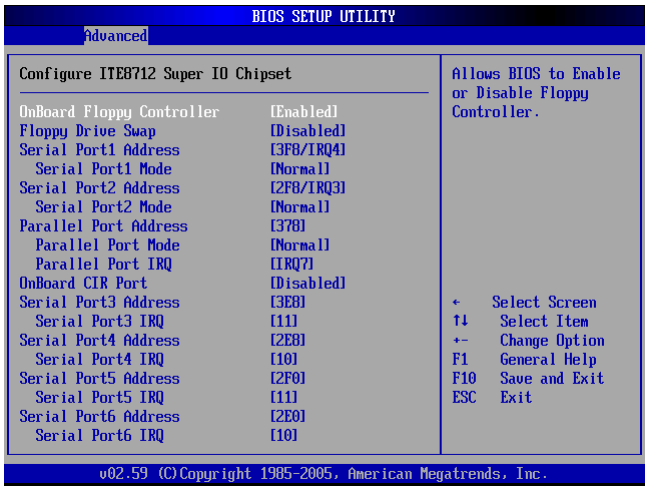
➔ **Floppy A/B**

Use the Floppy A/B option to configure the floppy disk drive. Options are listed below:

- Disabled
- 360 KB 51/4”
- 1.2 MB 51/4”
- 720 KB 31/2”
- 1.44 MB 31/2” **DEFAULT**
- 2.88 MB 31/2”

### 6.3.4 Super IO Configuration

Use the Super IO Configuration menu (BIOS Menu 7) to set or change the configurations for the FDD controllers, parallel ports and serial ports.




**BIOS Menu 7: Super IO Configuration**

➔ **OnBoard Floppy Controller [Enabled]**

Use the OnBoard Floppy Controller to enable or disable the floppy controller. If a floppy disk is not being used in the system, disabling this option frees up system resources that can be redirected elsewhere in the system.

➔ **Disabled** Allows BIOS to disable the floppy controller

➔ **Enabled** **DEFAULT** Allows BIOS to enable the floppy controller

➔ **Serial Port1 Address [3F8/IRQ4]**

Use the Serial Port1 Address option to select the Serial Port 1 base address.

➔ **Disabled** No base address is assigned to Serial Port 1

➔ **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4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- ➔ **3E8/IRQ4** Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
- ➔ **2E8/IRQ3** Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port1 Mode [Normal]**

Use the Serial Port1 Mode option to select the Serial Port1 operational mode.

- ➔ **Normal** **DEFAULT** Serial Port 1 mode is normal
- ➔ **IrDA** Serial Port 1 mode is IrDA
- ➔ **ASK IR** Serial Port 1 mode is ASK IR

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the Serial Port2 Address option to select the Serial Port 2 base address.

- ➔ **Disabled** No base address is assigned to Serial Port 2
- ➔ **2F8/IRQ3** **DEFAULT** Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
- ➔ **3E8/IRQ4** Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
- ➔ **2E8/IRQ3** Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [Normal]**

Use the Serial Port2 Mode option to select the Serial Port2 operational mode.

- ➔ **Normal** **DEFAULT** Serial Port 2 mode is normal

- ➔ **IrDA** Serial Port 2 mode is IrDA
- ➔ **ASK IR** Serial Port 2 mode is ASK IR

➔ **Parallel Port Address [378]**

Use the Parallel Port Address option to select the parallel port base address.

- ➔ **Disabled** No base address is assigned to the Parallel Port
- ➔ **378** **DEFAULT** Parallel Port I/O port address is 378
- ➔ **278** Parallel Port I/O port address is 278
- ➔ **3BC** Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

Use the Parallel Port Mode option to select the mode the parallel port operates in.

- ➔ **Normal** **DEFAULT** The normal parallel port mode is the standard mode for parallel port operation.
- ➔ **EPP** The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.


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➔ **ECP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode

➔ **ECP+EPP** The parallel port is also compatible with both ECP and EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

Use the Parallel Port IRQ option to set the parallel port interrupt address.

➔ **IRQ5** IRQ5 is assigned as the parallel port interrupt address

➔ **IRQ7** **DEFAULT** IRQ7 is assigned as the parallel port interrupt address

➔ **Onboard CIR Port [Disabled]**

Use the **Onboard CIR Port** option to select the CIR base address.

➔ **Disabled** **DEFAULT** No base address is assigned to CIR

➔ **3E0** CIR base address is 3E0

➔ **2E0** CIR base address is 2E0

➔ **Serial Port3 Address [3E8]**

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

➔ **Disabled** No base address is assigned to serial port 3

➔ **3E8** **DEFAULT** Serial port 3 I/O port address is 3E8

- ➔ **2E8** Serial port 3 I/O port address is 2E8
- ➔ **2E0** Serial port 3 I/O port address is 2E0

➔ **Serial Port3 IRQ [11]**

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

- ➔ **4** Serial port 3 IRQ address is 4
- ➔ **9** Serial port 3 IRQ address is 9
- ➔ **10** Serial port 3 IRQ address is 10
- ➔ **11** **DEFAULT** Serial port 3 IRQ address is 11

➔ **Serial Port4 Address [2E8]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- ➔ **Disabled** No base address is assigned to serial port 3
- ➔ **3E8** Serial port 4 I/O port address is 3E8
- ➔ **2E8** **DEFAULT** Serial port 4 I/O port address is 2E8
- ➔ **2E0** Serial port 4 I/O port address is 2E0

➔ **Serial Port4 IRQ [10]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

- ➔ **3** **DEFAULT** Serial port 4 IRQ address is 3
- ➔ **9** Serial port 4 IRQ address is 9
- ➔ **10** **DEFAULT** Serial port 4 IRQ address is 10
- ➔ **11** Serial port 4 IRQ address is 11


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➔ **Serial Port5 Address [2F0]**

Use the **Serial Port5 IRQ** option to select the interrupt address for serial port 5.

| | | |
|---|---|---|
| ➔ **Disabled** | | No base address is assigned to serial port 5 |
| ➔ **3E8** | | Serial port 5 I/O port address is 3E8 |
| ➔ **2E8** | | Serial port 5 I/O port address is 2E8 |
| ➔ **2F0** | **DEFAULT** | Serial port 5 I/O port address is 2F0 |
| ➔ **2E0** | | Serial port 5 I/O port address is 2E0 |

➔ **Serial Port5 IRQ [11]**

Use the **Serial Port5 IRQ** option to select the interrupt address for serial port 5.

| | | |
|---|---|---|
| ➔ **10** | | Serial port 5 IRQ address is 10 |
| ➔ **11** | **DEFAULT** | Serial port 5 IRQ address is 11 |

➔ **Serial Port6 Address [2E0]**

Use the **Serial Port6 IRQ** option to select the interrupt address for serial port 6.

| | | |
|---|---|---|
| ➔ **Disabled** | | No base address is assigned to serial port 6 |
| ➔ **3E8** | | Serial port 6 I/O port address is 3E8 |
| ➔ **2E8** | | Serial port 6 I/O port address is 2E8 |
| ➔ **2F0** | **DEFAULT** | Serial port 6 I/O port address is 2F0 |
| ➔ **2E0** | | Serial port 6 I/O port address is 2E0 |

➔ **Serial Port6 IRQ [10]**

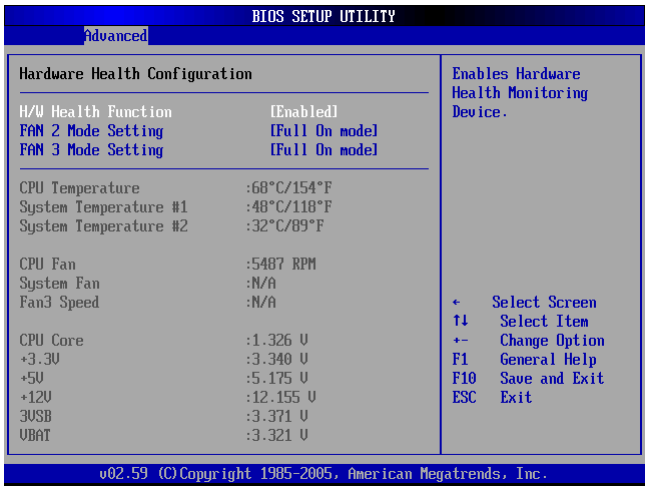
Use the **Serial Port6 IRQ** option to select the interrupt address for serial port 6.

➔ **10** **DEFAULT** Serial port 6 IRQ address is 10

➔ **11** Serial port 6 IRQ address is 11

## 6.3.5 Hardware Health Configuration

The Hardware Health Configuration menu (BIOS Menu 8) shows the operating temperature, fan speeds and system voltages.




**BIOS Menu 8: Hardware Health Configuration**

➔ **H/W Health Function [Enabled]**

Use the **H/W Health Function** to enable the monitoring of the system environmental parameters.

➔ **Disabled** Disables the health monitoring function

➔ **Enabled** **DEFAULT** Enables the health monitoring function

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➔ **FAN 2 Mode Setting [Full On Mode]**

Use the **FAN 2 Mode Setting** option to configure the second fan.

| | | |
|---|---|---|
| ➔ **Full On Mode** | **DEFAULT** | Fan is on all the time |
| ➔ **Automatic mode** | | Fan is off when the temperature is low enough. Parameters must be set by the user. |
| ➔ **PWM Manual mode** | | Pulse width modulation set manually |

➔ **FAN 3 Mode Setting [Full On Mode]**

Use the **FAN 3 Mode Setting** option to configure the second fan.

| | | |
|---|---|---|
| ➔ **Full On Mode** | **DEFAULT** | Fan is on all the time |
| ➔ **Automatic mode** | | Fan is off when the temperature is low enough. Parameters must be set by the user. |
| ➔ **PWM Manual mode** | | Pulse width modulation set manually |

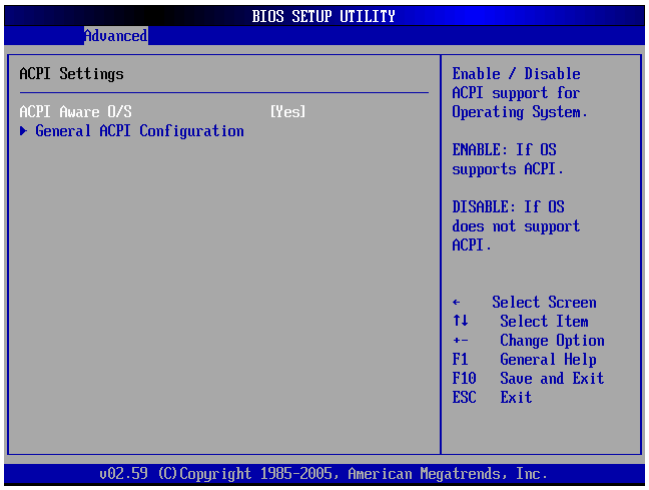
The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - CPU Temperature
  - System Temperature #1
  - System Temperature #2
- **Fan Speeds**: The following cooling fan speeds are monitored
  - CPU Fan
  - System Fan
  - Fan3 Speed
- **Voltages**: The following system voltages are monitored
  - CPU Core
  - +3.3V
  - +5V

- +12V
- 3VSB
- VBAT

### 6.3.6 ACPI Configuration

The ACPI Configuration menu (BIOS Menu 9) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.




**BIOS Menu 9: ACPI Configuration**

➔ **ACPI Aware O/S [Yes]**

Use the ACPI Aware O/S option to enable the system to configure ACPI power saving options. ACPI can only be implemented if the system OS complies with the ACPI standard. Windows 98, Windows 2000, and Windows XP all comply with ACPI.

➔ **No** Disables the ACPI support for the OS. This selection should be disabled if the OS does not support ACPI

➔ **Yes** **DEFAULT** Enables the ACPI support for the operating system. This selection should be enabled if the OS does support ACPI

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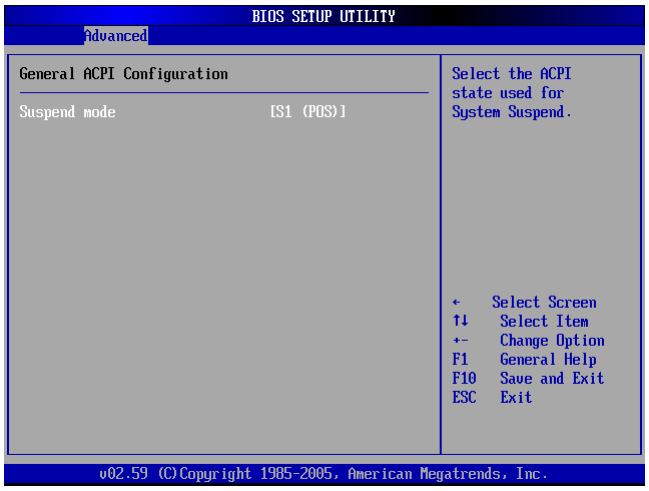
### 6.3.6.1 General ACPI Configuration

Use the General ACPI Configuration menu (BIOS Menu 10) to select the ACPI state when the system is suspended.




**BIOS Menu 10: General ACPI Configuration**

➔ **Suspend Mode [S1 (POS)]**

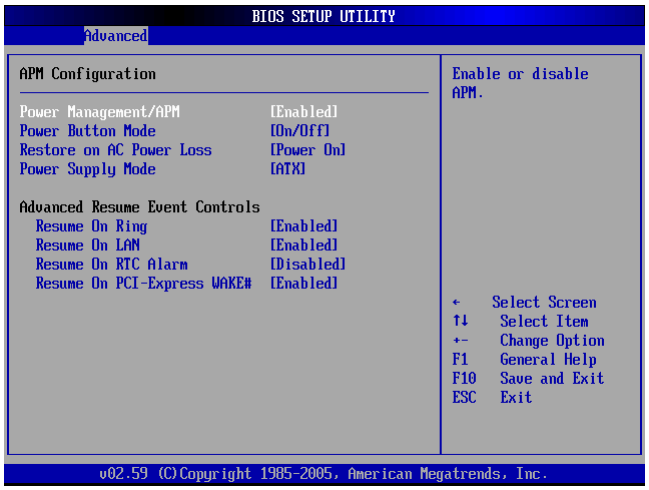
Use the Suspend Mode option to specify the sleep state the system enters when it is not being used.

➔ **S1 (POS)** **DEFAULT** The system enters S1(POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (STR)** The system enters a S3(STR) sleep state. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

### 6.3.7 APM Configuration

The **APM Configuration** menu (**BIOS Menu 11**) allows the advanced power management options to be configured.




**BIOS Menu 11: Advanced Power Management Configuration**

➔ **Power Management/APM [Enabled]**

Use the **Power Management/APM** BIOS option to enable access to the advanced power management features. If this option is disabled, the only other option on the screen is the **Power Button Mode**.

➔ **Disabled** Disables the Advanced Power Management (APM) feature

➔ **Enabled** **DEFAULT** Enables the APM feature

➔ **Power Button Mode [On/Off]**

Use the **Power Button Mode** BIOS to specify how the power button functions.

➔ **On/Off** **DEFAULT** When the power button is pressed the system is either turned on or off

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➔ **Suspend** When the power button is pressed the system goes into suspend mode

➔ **Restore on AC Power Loss [Power Off]**

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off** **DEFAULT** The system remains turned off.

➔ **Power On** The system turns on.

➔ **Last State** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Power Supply Mode [ATX]**

Use the **Power Supply Mode** BIOS option to to select the power supply that is connected to the system.

➔ **AT** An AT power supply is connected to the system

➔ **ATX** **DEFAULT** An ATX power supply is connected to the system

➔ **Resume on Ring [Enabled]**

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

➔ **Disabled** Wake event not generated by an incoming call

➔ **Enabled** **DEFAULT** Wake event generated by an incoming call

➔ **Resume on Lan [Enabled]**

The **Resume on Lan** BIOS option specifies if the system is roused from a suspended or standby state when there is activity on the LAN.

| | | |
|---|---|---|
| ➔ **Disabled** | | Wake event not generated by LAN activity |
| ➔ **Enabled** | **DEFAULT** | Wake event generated by LAN activity |

➔ **Resume On RTC Alarm [Disabled]**

Use the **Resume On RTC Alarm** option to specify the time the system should be roused from a suspended state.

| | | |
|---|---|---|
| ➔ **Disabled** | **DEFAULT** | The real time clock (RTC) cannot generate a wake event |
| ➔ **Enabled** | | If selected, the following appears with values that can be selected:<br>➔ **RTC Alarm Date (Days)**<br>➔ **System Time**<br>After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off. |

➔ **Resume on PCI-Express WAKE# [Enabled]**

The **Resume on PCI-Express WAKE#** BIOS option specifies if the system is roused from a suspended or standby state when there is activity on the PCI-Express bus.

| | | |
|---|---|---|
| ➔ **Disabled** | | Wake event not generated by PCI-Express activity |
| ➔ **Enabled** | **DEFAULT** | Wake event generated by PCI-Express activity |


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### 6.3.8 ASF Configuration

The **ASF Configuration** menu (BIOS Menu 12) controls the system's ASF functions as part of a remote client management network.

**BIOS Menu 12: ASF Configuration**

➔ **ASF Support [Enabled]**

Use the **ASF Support** BIOS option to control the system's ability to connect to a remote management server.

➔ **Disabled** The system will not communicate with a remote management server.

➔ **Enabled** **DEFAULT** The Alert Standard Format (ASF) controller is activated and can communicate with a remote management server.

### 6.3.9 MPS Configuration

Use the **MPS Configuration** menu (**BIOS Menu 13**) to select the multi-processor table.

**BIOS Menu 13: MPS Configuration**

➔ **MPS Revision [1.4]**

Use the **Multiprocessor Specification (MPS) for OS** option to specify the MPS version to be used.

➔ **1.1** MPS version 1.1 is used

➔ **1.4 DEFAULT** MPS version 1.4 is used

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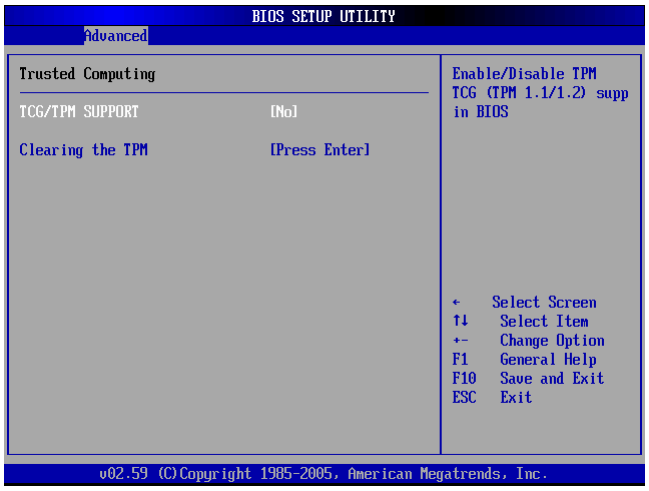
### 6.3.10 Trusted Computing

Use the **Trusted Computing** menu (BIOS Menu 14) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).




**BIOS Menu 14: Trusted Computing**

➔ **TCG/TPM Support [No]**

Use the **TCG/TPM Support** option to configure support for the TPM.

➔ **No** **DEFAULT** TPM support is disabled.

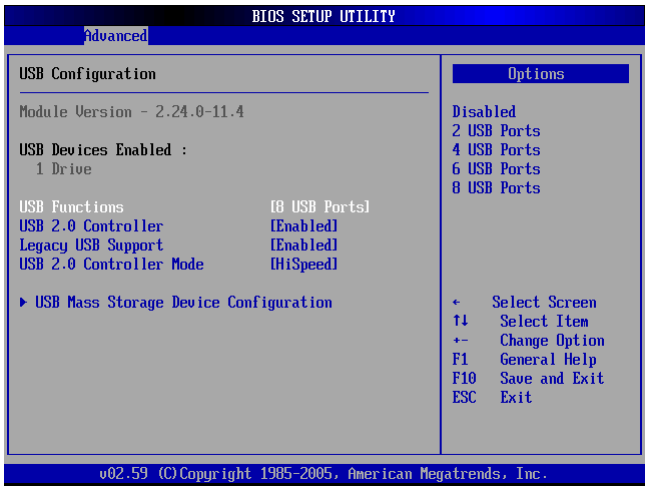
➔ **Yes** TPM support is enabled.

➔ **Clearing the TPM [Press Enter]**

Use the **Clearing the TPM** option to clear the information stored in the TPM.

### 6.3.11 USB Configuration

Use the USB Configuration menu (BIOS Menu 15) to read USB configuration information and configure the USB settings.




**BIOS Menu 15: USB Configuration**

➔ **USB Configuration**

The USB Configuration field shows the system USB configuration. The items listed are:

- Module Version: x.xx.x-xx.x

➔ **USB Function [8 USB Ports]**

Use the USB Function BIOS option to enable or disable a specified number of USB ports. If only two USB ports are being used, disabling the remaining six USB frees up system resources that can be redirected elsewhere.

| | | |
|---|---|---|
| ➔ | **Disabled** | USB function support disabled |
| ➔ | **2 USB Ports** | Two USB ports are enabled |
| ➔ | **4 USB Ports** | Four USB ports are enabled |
| ➔ | **6 USB Ports** | Six USB ports are enabled |

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➔ **8 USB Ports** **DEFAULT** Eight USB ports are enabled

➔ **USB 2.0 Controller [Enabled]**

Use the USB 2.0 Controller BIOS option to enable or disable the USB 2.0 controller

➔ **Disabled** USB 2.0 controller disabled

➔ **Enabled** **DEFAULT** USB 2.0 controller enabled

➔ **Legacy USB Support [Enabled]**

Use the Legacy USB Support BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔ **Disabled** Legacy USB support disabled

➔ **Enabled** **DEFAULT** Legacy USB support enabled

➔ **Auto** Legacy USB support disabled if no USB devices are connected

➔ **USB2.0 Controller Mode [HiSpeed]**

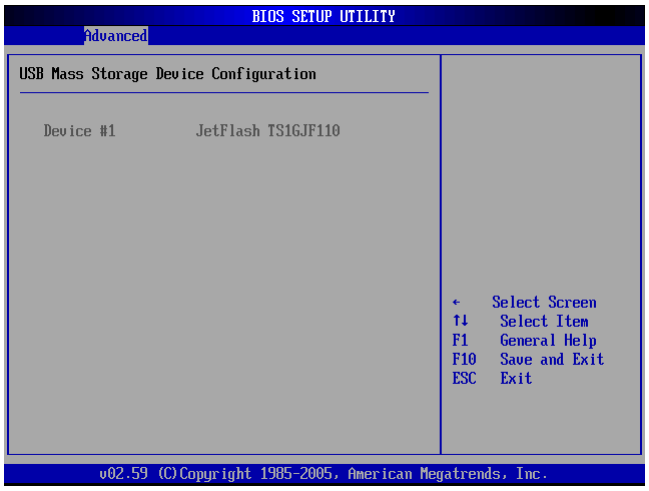
The **USB 2.0 Controller Mode** BIOS option sets the speed of the USB 2.0 controller.

➔ **FullSpeed** The controller is capable of operating at full speed (12Mbits/second)

➔ **HiSpeed** **DEFAULT** The controller is capable of operating at high speed (480Mbits/second)

### 6.3.11.1 USB Mass Storage Device Configuration

Use the USB Mass Storage Device Configuration menu (BIOS Menu 16) lists the USB mass storage class devices.




**BIOS Menu 16: USB Mass Storage Device Configuration**

## 6.4 Boot

Use the Boot menu (**BIOS Menu 17**) to configure system boot options.

**BIOS Menu 17: Boot**

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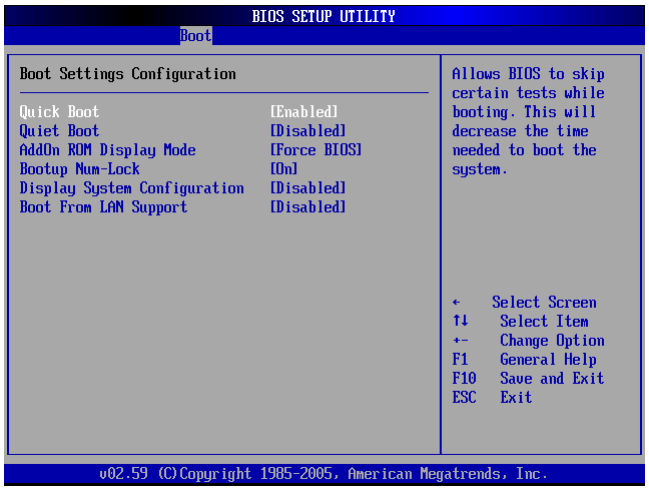
### 6.4.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (BIOS Menu 18) to configure advanced system boot options.


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
Display System Configuration [Disabled]
Boot From LAN Support [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.59 (C)Copyright 1985-2005, American Megatrends, Inc.

**BIOS Menu 18: Boot Settings Configuration**

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

| | | | |
|---|---|---|---|
| ➔ | **Disabled** | | No POST procedures are skipped |
| ➔ | **Enabled** | **DEFAULT** | Some POST procedures are skipped to decrease the system boot time |

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

| | | | |
|---|---|---|---|
| ➔ | **Disabled** | **DEFAULT** | Normal POST messages displayed |
| ➔ | **Enabled** | | OEM Logo displayed instead of POST messages |

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

| | | |
|---|---|---|
| ➔ **Force BIOS** | **DEFAULT** | The system forces third party BIOS to display during system boot. |
| ➔ **Keep Current** | | The system displays normal information during system boot. |

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

| | | |
|---|---|---|
| ➔ **Off** | | Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged. |
| ➔ **On** | **DEFAULT** | Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit. |

➔ **Display System Configuration [Enabled]**

Use the **Display System Configuration** option to select whether or not system configuration information is shown on screen after POST.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➔ **Disabled** System configuration information is not shown on screen after POST.

➔ **Enabled** **DEFAULT** System configuration information is shown on screen after POST.

➔ **Boot From LAN Support [Disabled]**

The **BOOT From LAN Support** option enables the system to be booted from a remote system.

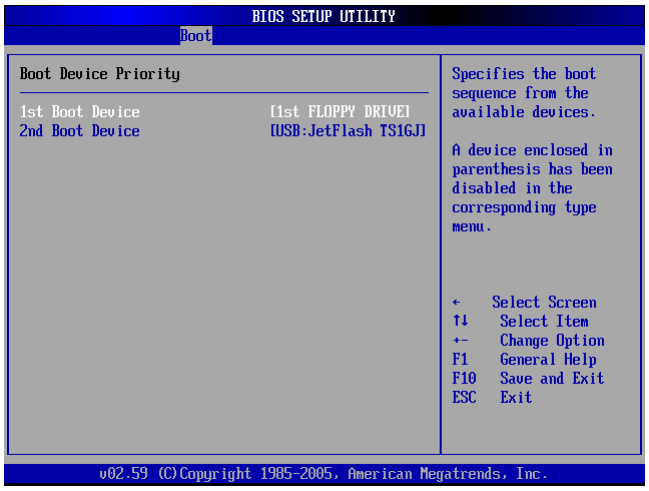
➔ **Disabled** **DEFAULT** Cannot be booted from a remote system through the LAN

➔ **Enabled** Can be booted from a remote system through the LAN

### 6.4.2 Boot Device Priority

Use the Boot Device Priority menu (BIOS Menu 19) to specify the boot sequence from the available devices. Possible boot devices may include:

- 1st FLOPPY DRIVE
- HDD
- CD/DVD


BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device [1st FLOPPY DRIVE]
2nd Boot Device [USB:JetFlash TS1GJ]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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**BIOS Menu 19: Boot Device Priority Settings**

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### 6.4.3 Removable Drives

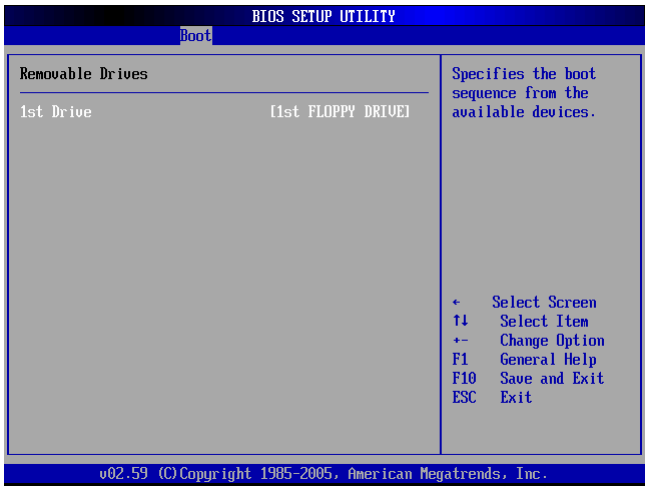
Use the Removable Drives menu (BIOS Menu 20) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

- 1st Drive [1st FLOPPY DRIVE]
- 2nd Drive [2nd FLOPPY DRIVE]

**NOTE:**

Only the drives connected to the system are shown. For example, if only one FDD is connected only "**1st Drive**" is listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available FDDs is shown. Select the first FDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.




**BIOS Menu 20: Removable Drives**

### 6.4.4 USB Drives

Use the USB Drives menu (BIOS Menu 21) to specify the boot sequence of the available USB devices. When the menu is opened, the USB devices connected to the system are listed as shown below:

- 1st Drive [1st USB DRIVE]
- 2nd Drive [2nd USB DRIVE]

**NOTE:**

Only the drives connected to the system are shown. For example, if only one USB drive is connected only "**1st Drive**" is listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available USB drives is shown. Select the first USB drive the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.

**BIOS Menu 21: USB Drives**

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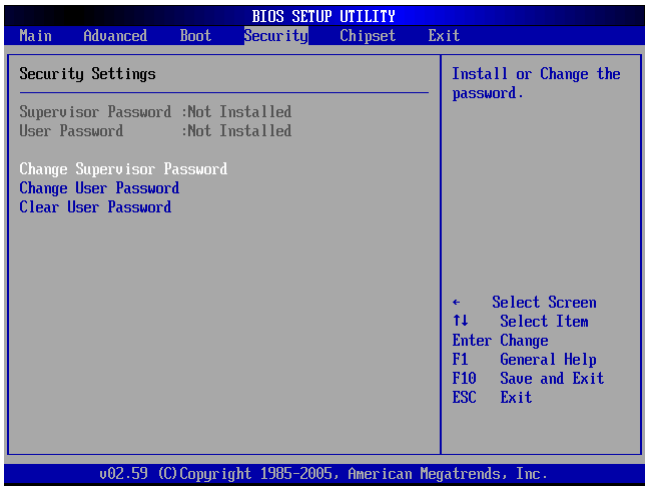
## 6.5 Security

Use the Security menu (BIOS Menu 22) to set system and user passwords.




**BIOS Menu 22: Security**

### ➔ Change Supervisor Password

Use the Change Supervisor Password to set or change a supervisor password. The default for this option is Not Installed. If a supervisor password must be installed, select this field and enter the password. After the password has been added, Install appears next to Change Supervisor Password.

### ➔ User Access Level [Full Access]

A supervisor password must be installed to make this option available. The **User Access Level** option specifies the access a normal user has to the BIOS settings.

| | | |
|---|---|---|
| ➔ **No Access** | | Users have no access to the **Setup Utility** |
| ➔ **View Only** | | Users can only view the **Setup Utility** |
| ➔ **Limited** | | Users can change limited fields like date and time |
| ➔ **Full Access** | **DEFAULT** | Users have full access to the **Setup Utility** |

➔ **Change User Password**

Use the Change User Password to set or change a user password. The default for this option is Not Installed. If a user password must be installed, select this field and enter the password. After the password has been added, Install appears next to Change User Password.

➔ **Clear User Password**

A user password must be installed to make this option available. Use the **Clear User Password** option to delete a user password.

➔ **Password Check [Setup]**

A supervisor password must be installed to make this option available. The **Password Check** option specifies when a user is prompted for the password.

| | | |
|---|---|---|
| ➔ **Setup** | **DEFAULT** | Users have to enter their password only when they enter the **Setup Utility** |
| ➔ **Always** | | Users have to enter their password whenever they boot the computer |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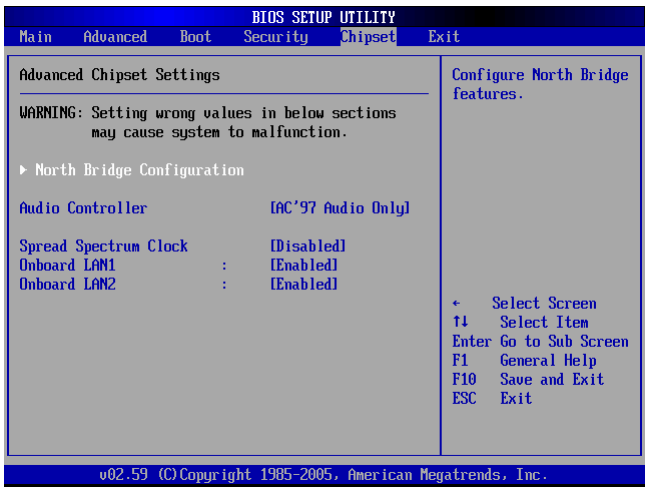
## 6.6 Chipset

Use the Chipset menu (BIOS Menu 23) to access the NorthBridge and SouthBridge configuration menus.

**WARNING:**

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.


BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below sections may cause system to malfunction.
North Bridge Configuration
Audio Controller [AC'97 Audio Only]
Spread Spectrum Clock [Disabled]
Onboard LAN1 : [Enabled]
Onboard LAN2 : [Enabled]
Configure North Bridge features.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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**BIOS Menu 23: Chipset**

➔ **Audio Controller [AC'97 Audio Only]**

The **Audio Controller** option enables or disables the audio controller.

➔ **AC'97 Audio Only** **DEFAULT** The on-board AC'97 audio controller is enabled.

➔ **All Disabled** The on-board audio controller is disabled.

➔ **Spread Spectrum Clock [Disabled]**

Use the **Spread Spectrum Clock** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

➔ **Disabled** **DEFAULT** EMI not reduced

➔ **Enabled** EMI reduced

➔ **Onboard LAN1 [Enabled]**

The **Onboard LAN1** option enables or disables the on-board LAN1.

➔ **Enabled** **DEFAULT** The on-board LAN1 controller is manually enabled

➔ **Disabled** The on-board LAN1 controller is manually disabled

➔ **Onboard LAN2 [Enabled]**

The **Onboard LAN2** option enables or disables the on-board LAN2.

➔ **Enabled** **DEFAULT** The on-board LAN2 controller is manually enabled

➔ **Disabled** The on-board LAN2 controller is manually disabled


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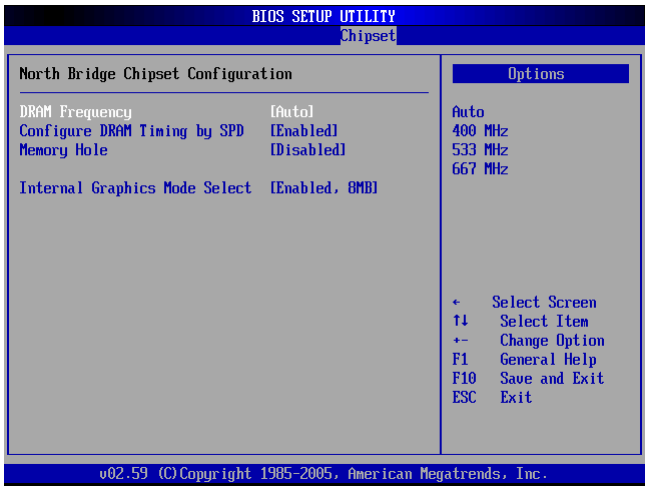
### 6.6.1 NorthBridge Configuration

Use the NorthBridge Configuration menu (BIOS Menu 24) to configure the northbridge chipset.




**BIOS Menu 24:NorthBridge Chipset Configuration**

➔ **DRAM Frequency [Auto]**

The **DRAM Frequency** option specifies the DRAM frequency or allows the system to automatically detect the DRAM frequency.

| | | |
|---|---|---|
| ➔ **400MHz** | | Sets the DRAM frequency to 400MHz |
| ➔ **533MHz** | | Sets the DRAM frequency to 533MHz |
| ➔ **667MHz** | | Sets the DRAM frequency to 667MHz |
| ➔ **Auto** | **DEFAULT** | Automatically selects the DRAM frequency |

➔ **Configure DRAM Timing by SPD [Enabled]**

The **Configure DRAM Timing by SPD** option determines if the system uses the SPD (Serial Presence Detect) EEPROM to configure the DRAM timing. The SPD EEPROM contains all necessary DIMM specifications the including speed of the individual components such as CAS and bank cycle time as well as valid settings for the module and

the manufacturer's code. The SPD enables the BIOS to read the spec sheet of the DIMMs on boot-up and then adjust the memory timing parameters accordingly.

| | | | |
|---|---|---|---|
| ➔ | **Disabled** | | DRAM timing parameters can be manually set using the DRAM sub-items |
| ➔ | **Enabled** | **DEFAULT** | DRAM timing parameter are set according to the DRAM Serial Presence Detect (SPD) |

The **Configure DRAM Timing by SPD** option is disabled, the following configuration options appear.

- DRAM CAS# Latency [5]
- DRAM RAS# to CAS# Delay [6 DRAM clocks]
- DRAM RAS# Precharge [6 DRAM clocks]
- DRAM RAS# Active to Precha [15 DRAM clocks]

### ➔ DRAM CAS# Latency [5]

The **DRAM CAS# Latency** option refers to the Column Address Strobe (CAS) delay time. To be able to change this configuration option the **Configure DRAM Timing by SPD** configuration option must be set to "**Disabled**." The following configuration options are available.

- 3 nanoseconds
- 4 nanoseconds
- 5 nanoseconds **DEFAULT**
- 6 nanoseconds

### ➔ DRAM RAS# to CAS# Delay [6 DRAM Clocks]

Use the **DRAM RAS# to CAS# Delay** option to specify the number of clock cycles must elapse between sending a RAS (row address strobe) signal and the CAS (column address strobe) signal. A pause is required between the RAS signal and the CAS signal to ensure the memory is correctly addressed. To be able to change this configuration option the

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**Configure DRAM Timing by SPD** configuration option must be set to "**Disabled**." Configuration options are listed below:

- 2 DRAM Clocks
- 3 DRAM Clocks
- 4 DRAM Clocks
- 5 DRAM Clocks
- 6 DRAM Clocks **DEFAULT**

➔ **DRAM RAS# Precharge [6 DRAM Clocks]**

Use the **DRAM RAS# Precharge** option to set the speed at which the RAM terminates the access of one row and start accessing another. To be able to change this configuration option the **Configure DRAM Timing by SPD** configuration option must be set to "**Disabled**." The following configuration options are available

- 2 DRAM Clocks
- 3 DRAM Clocks
- 4 DRAM Clocks
- 5 DRAM Clocks
- 6 DRAM Clocks **DEFAULT**

➔ **DRAM RAS# Activate to Precha [15 DRAM Clocks]**

Use the **DRAM RAS# Activate to Precha** option to specify the length of the delay between the activation and precharge commands for the RAS signal. That is how long after activation can the access cycle be started again. This influences row activation time that is considered when memory has hit the last column in a specific row, or when an entirely different memory location is requested. To be able to change this configuration option the **Configure DRAM Timing by SPD** configuration option must be set to "**Disabled**." The following configuration options are available:

- 4 DRAM Clocks
- 5 DRAM Clocks
- 6 DRAM Clocks
- 7 DRAM Clocks

- 8 DRAM Clocks
- 9 DRAM Clocks
- 10 DRAM Clocks
- 11 DRAM Clocks
- 12 DRAM Clocks
- 13 DRAM Clocks
- 14 DRAM Clocks
- 15 DRAM Clocks **DEFAULT**

➔ **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

| | | |
|---|---|---|
| ➔ **Disabled** | **DEFAULT** | Memory is not reserved for ISA expansion cards |
| ➔ **15MB – 16MB** | | Between 15MB and 16MB of memory is reserved for ISA expansion cards |

➔ **Internal Graphics Mode Select [Enable, 8MB]**

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

| | | |
|---|---|---|
| ➔ **Disable** | | |
| ➔ **Enable, 1MB** | | 1MB of memory used by internal graphics device |
| ➔ **Enable, 8MB** | **DEFAULT** | 8MB of memory used by internal graphics device |


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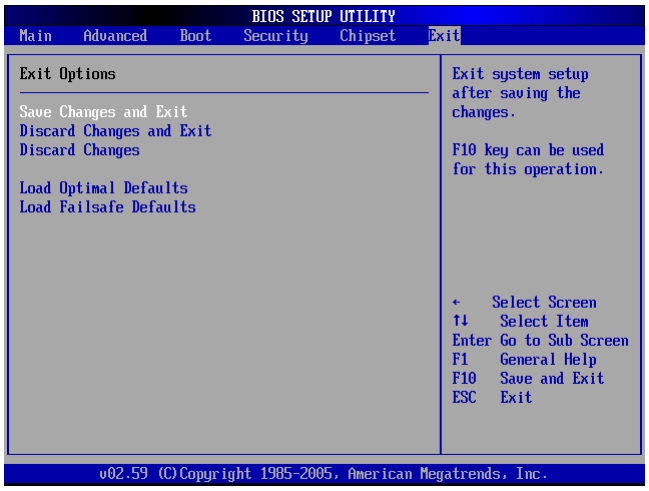
## 6.7 Exit

Use the Exit menu (BIOS Menu 25) to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.59 (C)Copyright 1985-2005, American Megatrends, Inc.

**BIOS Menu 25:Exit**

### ➔ Save Changes and Exit

Use the Save Changes and Exit option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

### ➔ Discard Changes and Exit

Use the Discard Changes and Exit option to exit the BIOS configuration setup program without saving the changes made to the system.

### ➔ Discard Changes

Use the Discard Changes option to discard the changes and remain in the BIOS configuration setup program.

### ➔ Load Optimal Defaults

Use the Load Optimal Defaults option to load the optimal default values for each of the parameters on the Setup menus. F9 key can be used for this operation.

➔ **Load Failsafe Defaults**

Use the Load Failsafe Defaults option to load failsafe default values for each of the parameters on the Setup menus. F8 key can be used for this operation.

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Chapter

7

# Driver Installation


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## 7.1 Available Software Drivers

**NOTE:**

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the CyberResearch website or contact technical support for the latest updates.

The following drivers can be installed on the system:

- Chipset driver
- VGA driver
- LAN driver
- Audio driver
- IDE controller

Installation instructions are given below.

## 7.2 Driver CD Auto-run

All the drivers for the MXGA are on the CD that came with the system. To install the drivers, please follow the steps below.

**Step 1:** Insert the CD into a CD drive connected to the system.

**NOTE:**

If the system does not initiate the "autorun" program when the CD is inserted, click the **Start** button, select **Run**, then type **X:\autorun.exe** (where **X:** is the system CD drive) to access the CyberResearch Driver CD main menu.

**Step 2:** The driver main menu appears (Figure 7-1).

**Figure 7-1: Introduction Screen**

**Step 3:** Click MXGA.

**Step 4:** A new screen with a list of available drivers appears (Figure 7-2).

CZEH DRIVERS
CPET / CPEU
MXGA DRIVERS
MAIN MENU
INSTALL DRIVERS
Welcome to the Driver Installation section.
Please choose from the selection on the left to install the desired drivers for your product.
CyberResearch
Branford, Connecticut USA

**Figure 7-2: Available Drivers**

**Step 5:** Select the driver to install from the list in **Figure 7-2**. Detailed driver installation instructions follow below.

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## 7.3 Chipset Driver Installation

To install the chipset driver, please follow the steps below.

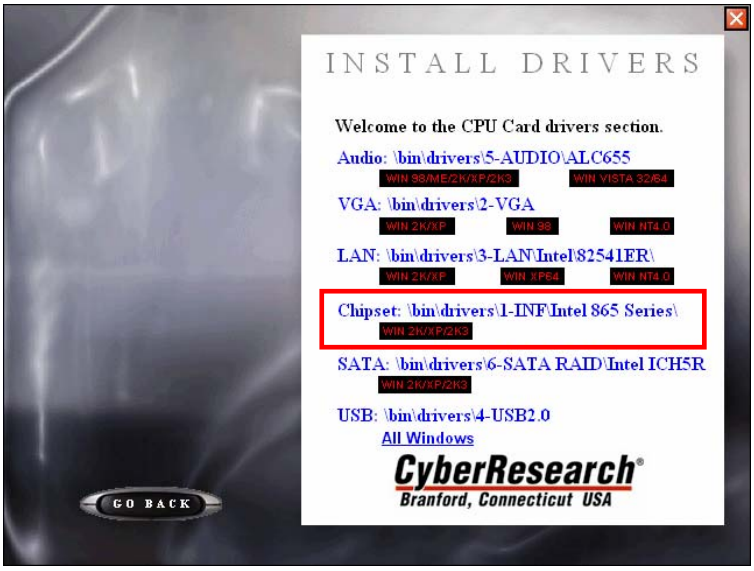


**Figure 7-3: Chipset Driver**

**Step 1:** Select **Chipset** from the list in Figure 7-3.

**Step 2:** A new window opens (Figure 7-4).

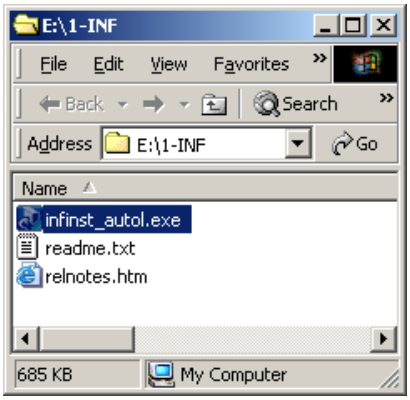


**Figure 7-4: Chipset Driver Installation Program**

**Step 3:** Double-click the **infinst_Autol.exe** icon.

**Step 4:** The welcome screen in Figure 7-5 appears.

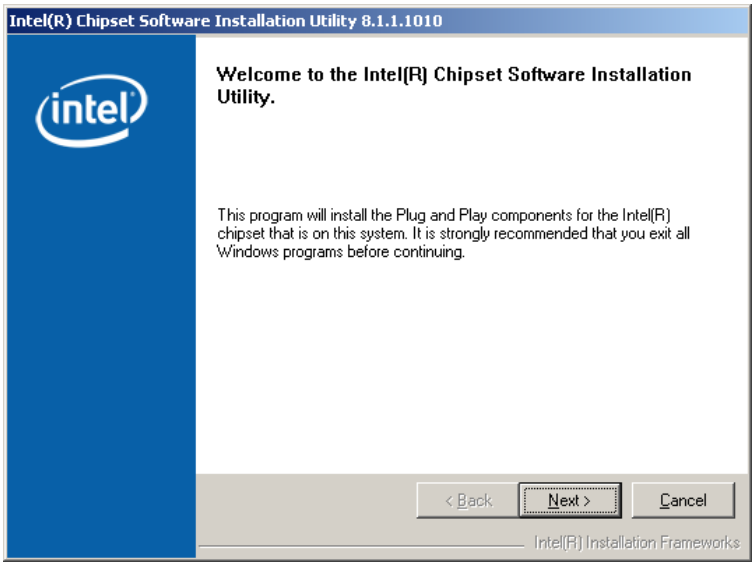
Intel(R) Chipset Software Installation Utility 8.1.1.1010
Welcome to the Intel(R) Chipset Software Installation Utility.
This program will install the Plug and Play components for the Intel(R) chipset that is on this system. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

**Figure 7-5: Chipset Driver Installation Welcome Screen**


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**Step 5:** Click **NEXT** to continue the installation process.

**Step 6:** The license agreement in Figure 7-6 appears.

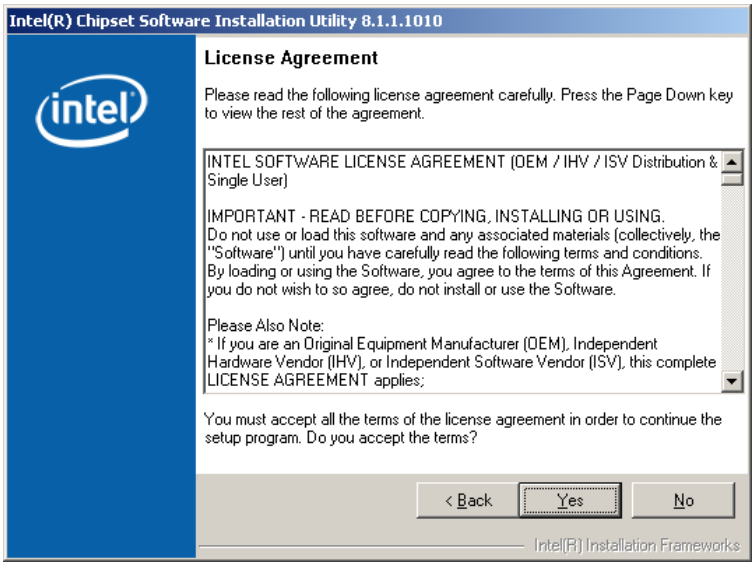
Intel(R) Chipset Software Installation Utility 8.1.1.1010
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

**Figure 7-6: Chipset Driver Installation License Agreement**

**Step 7:** Read the license agreement. To accept the terms and conditions stipulated in the agreement, click **YES**.

**Step 8:** The Readme file in Figure 7-7 appears.

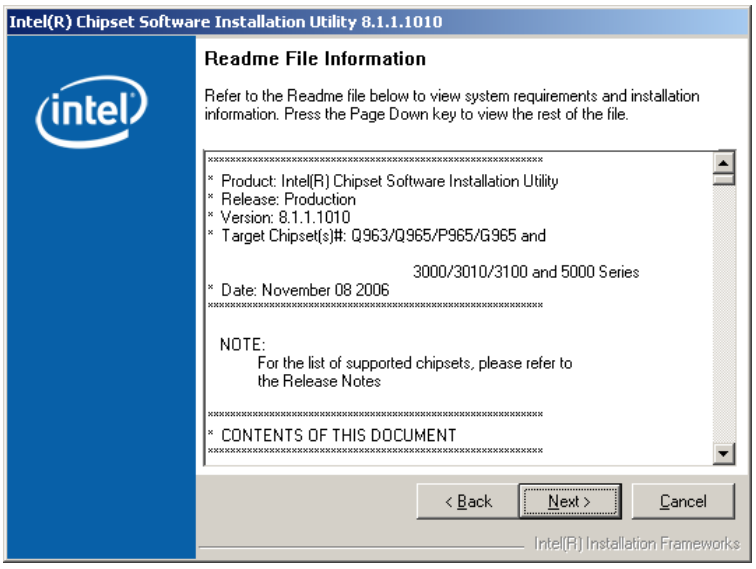
Intel(R) Chipset Software Installation Utility 8.1.1.1010
Readme File Information
Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
* Product: Intel(R) Chipset Software Installation Utility
* Release: Production
* Version: 8.1.1.1010
* Target Chipset(s)#: Q963/Q965/P965/G965 and
3000/3010/3100 and 5000 Series
* Date: November 08 2006
NOTE:
For the list of supported chipsets, please refer to the Release Notes
* CONTENTS OF THIS DOCUMENT
< Back
Next >
Cancel
Intel(R) Installation Frameworks

**Figure 7-7: Chipset Driver Readme File Information**

**Step 9:** Read the Readme file information and then click **NEXT** to start the driver installation.


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**Step 10:** After the driver installation process is complete, a confirmation screen appears (Figure 7-8) and click Finish to complete the installation.

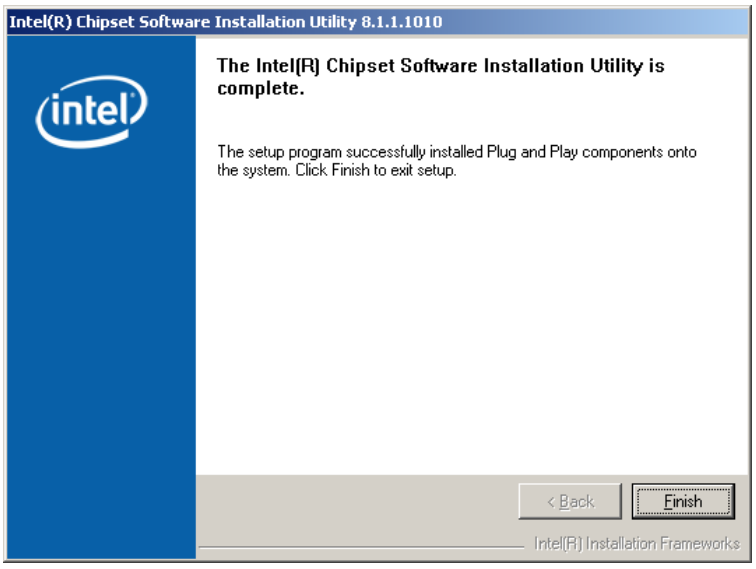
Intel(R) Chipset Software Installation Utility 8.1.1.1010
The Intel(R) Chipset Software Installation Utility is complete.
The setup program successfully installed Plug and Play components onto the system. Click Finish to exit setup.
< Back
Finish
Intel(R) Installation Frameworks

**Figure 7-8: Chipset Driver Installation Complete**

## 7.4 Intel Graphics Media Accelerator Driver

To install the chipset driver, please follow the steps below.

**Step 1:** Select the VGA driver from the list in Figure 7-3.

**Step 2:** A new window opens (Figure 7-9).

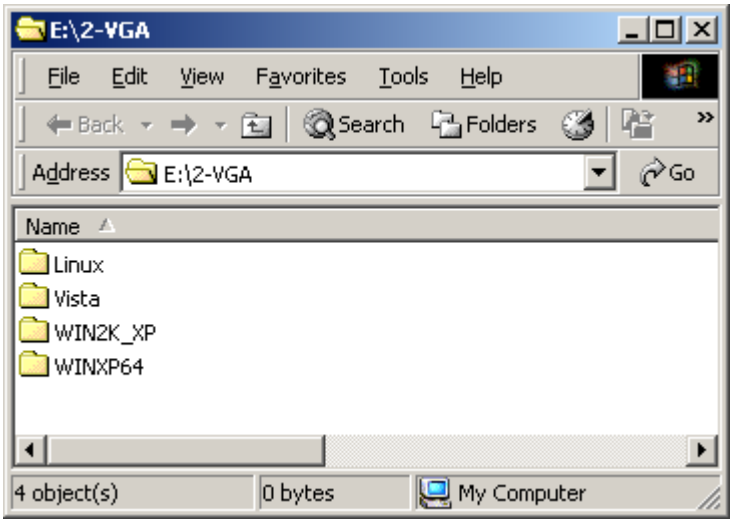


**Figure 7-9: Select the Operating System**

**Step 3:** Double-click the appropriate operating system folder.

**Step 4:** A new window appears (Figure 7-10).

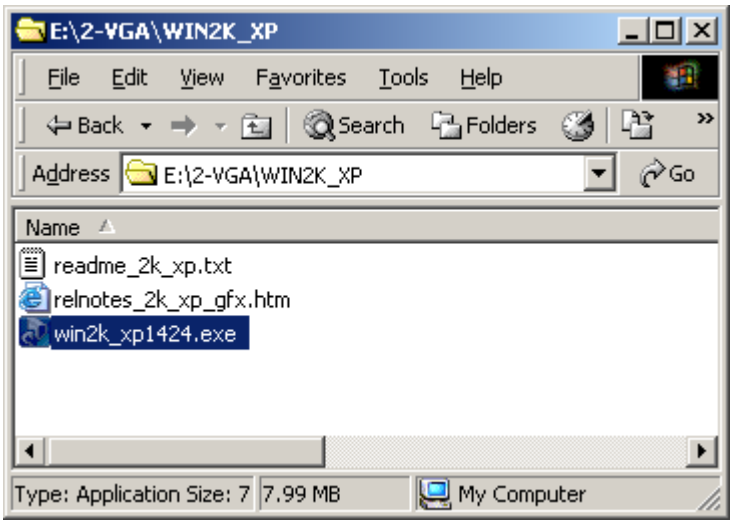


**Figure 7-10: VGA Driver**

**Step 5:** Double-click the installation program icon to continue the installation process.


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**Step 6:** The Readme information file shown in Figure 7-11 appears.

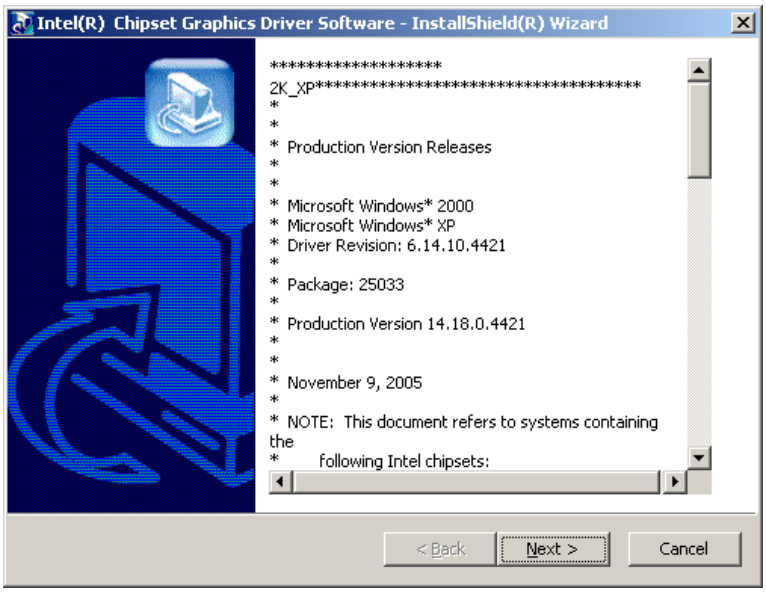


**Figure 7-11: Intel® Graphics Media Accelerator InstallShield Wizard**

**Step 7:** Read the Readme file information and click **NEXT** to begin extracting files (Figure 7-12).

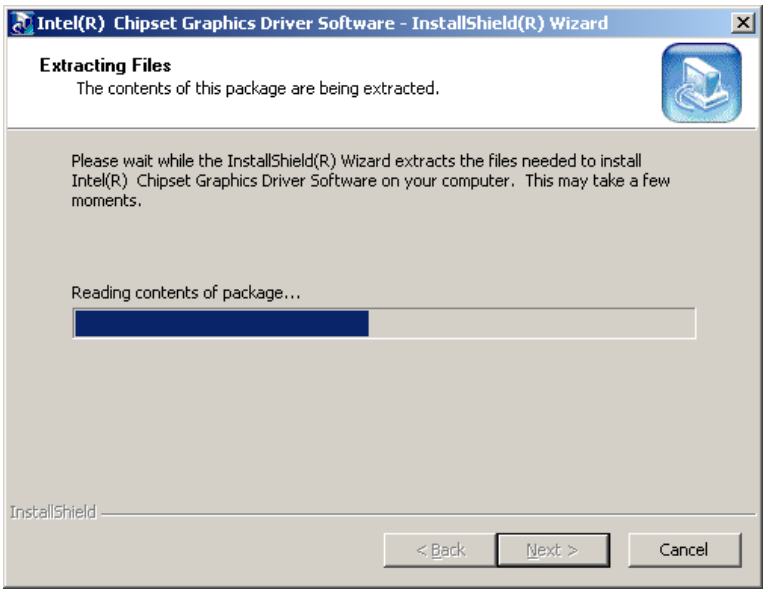
Intel(R) Chipset Graphics Driver Software - InstallShield(R) Wizard
Extracting Files
The contents of this package are being extracted.
Please wait while the InstallShield(R) Wizard extracts the files needed to install Intel(R) Chipset Graphics Driver Software on your computer. This may take a few moments.
Reading contents of package...
InstallShield
< Back
Next >
Cancel

**Figure 7-12: InstallShield Wizard Extracting Files**


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**Step 8:** The **Graphics Media Accelerator Driver Welcome** screen appears (Figure 7-13).

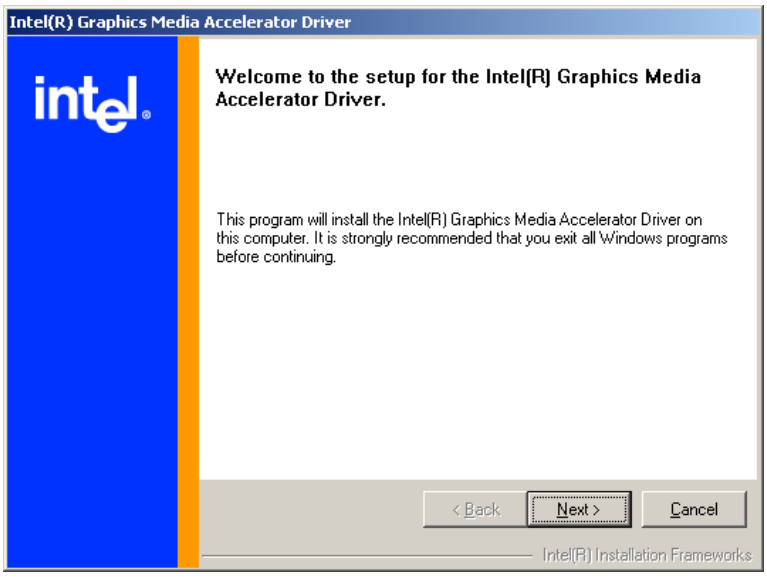
Intel(R) Graphics Media Accelerator Driver
intel
Welcome to the setup for the Intel(R) Graphics Media Accelerator Driver.
This program will install the Intel(R) Graphics Media Accelerator Driver on this computer. It is strongly recommended that you exit all Windows programs before continuing.
< Back
Next >
Cancel
Intel(R) Installation Frameworks

**Figure 7-13: Intel® Graphics Media Accelerator Driver Welcome Screen**

**Step 9:** Click **NEXT** and a license agreement appears (Figure 7-14).

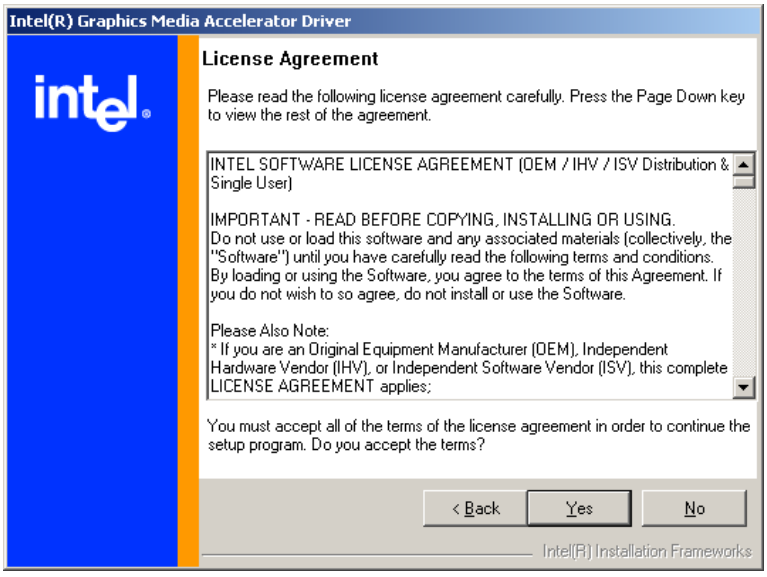
Intel(R) Graphics Media Accelerator Driver
intel
License Agreement
Please read the following license agreement carefully. Press the Page Down key to view the rest of the agreement.
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
< Back
Yes
No
Intel(R) Installation Frameworks

**Figure 7-14: Intel® Graphics Media Accelerator Driver License Agreement**

**Step 10:** Read the license agreement. To accept the terms and conditions stipulated in

the license agreement shown, click **YES** and the installation notice appears (Figure 7-15) as the driver is installed.

**Figure 7-15: Intel® Graphics Media Accelerator Driver Installing Notice**

**Step 11:** After the driver installation process is complete, a confirmation screen appears (Figure 7-16).

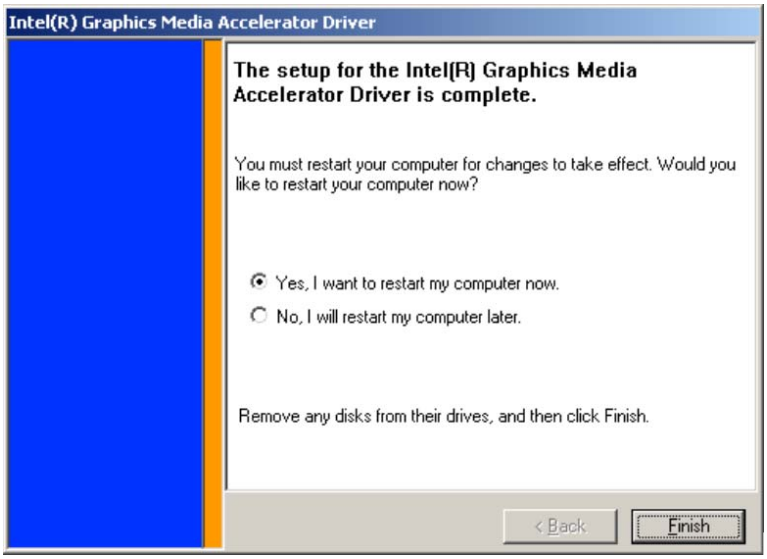
Intel(R) Graphics Media Accelerator Driver
The setup for the Intel(R) Graphics Media Accelerator Driver is complete.
You must restart your computer for changes to take effect. Would you like to restart your computer now?
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish.
< Back
Finish

**Figure 7-16: Intel® Graphics Media Accelerator Installation Complete**

**Step 12:** The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

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## 7.5 Broadcom LAN Driver (for GbE LAN) Installation

To install the Broadcom LAN driver, please follow the steps below.

**Step 1:** Open **Windows Control Panel (**Figure 7-17).

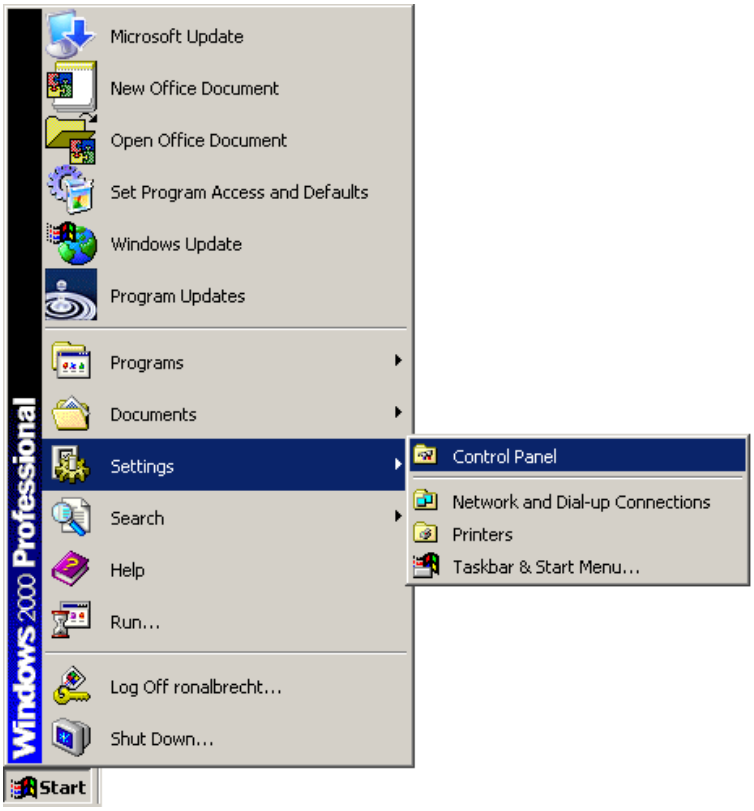


**Figure 7-17: Windows Control Panel**

**Step 2:** Double-click the **System** icon (Figure 7-18).

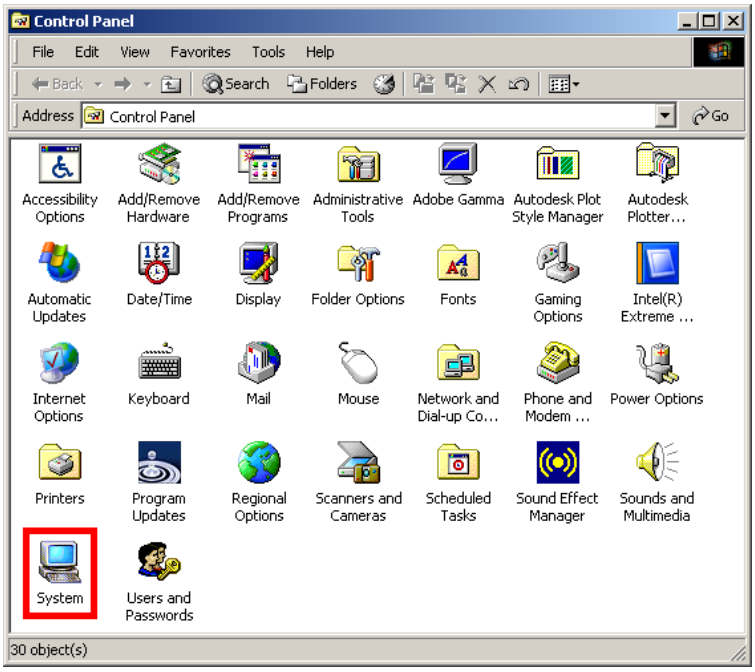


**Figure 7-18: System Icon**


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**Step 3:** Click the **Device Manager** tab (Figure 7-19).

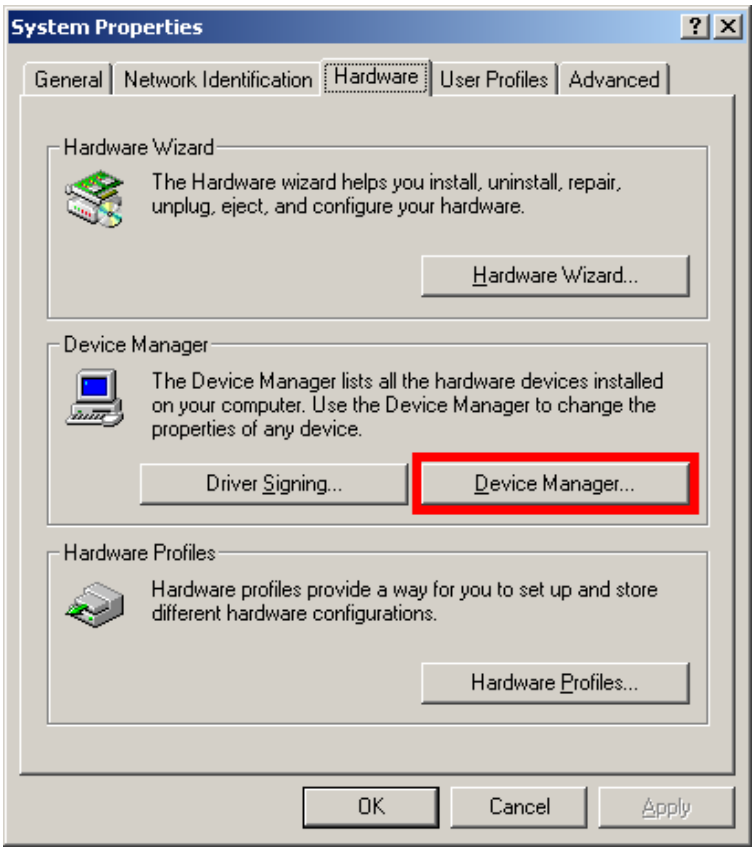
System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

**Figure 7-19: Device Manager Tab**

**Step 4:** A list of system hardware devices appears (Figure 7-20).

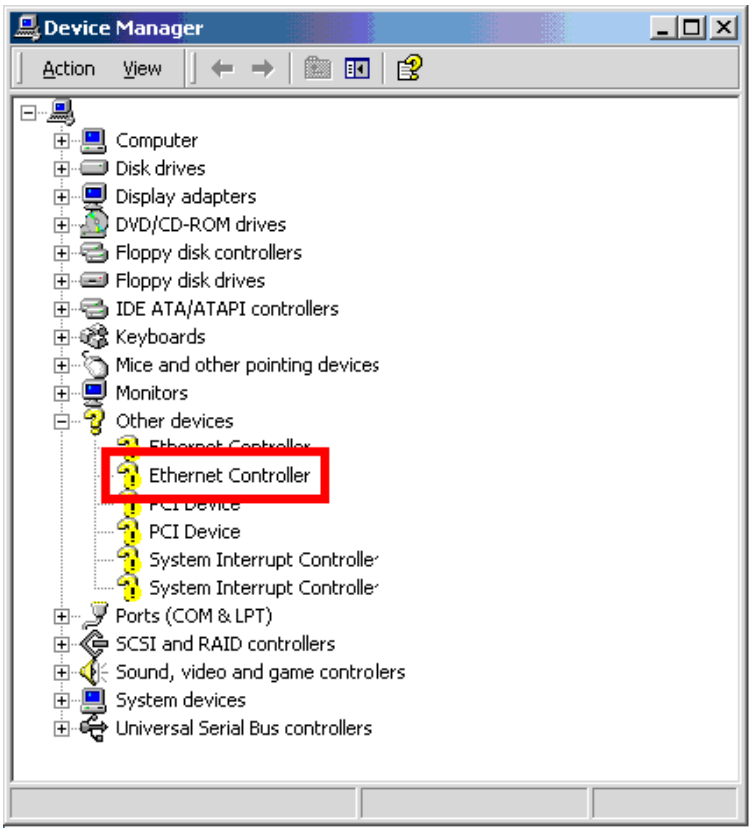


**Figure 7-20: Device Manager List**

**Step 5:** Double-click the listed device that has question marks next to it (this means Windows does not recognize the device).

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**Step 6:** The **Device Driver Wizard** appears (Figure 7-21).

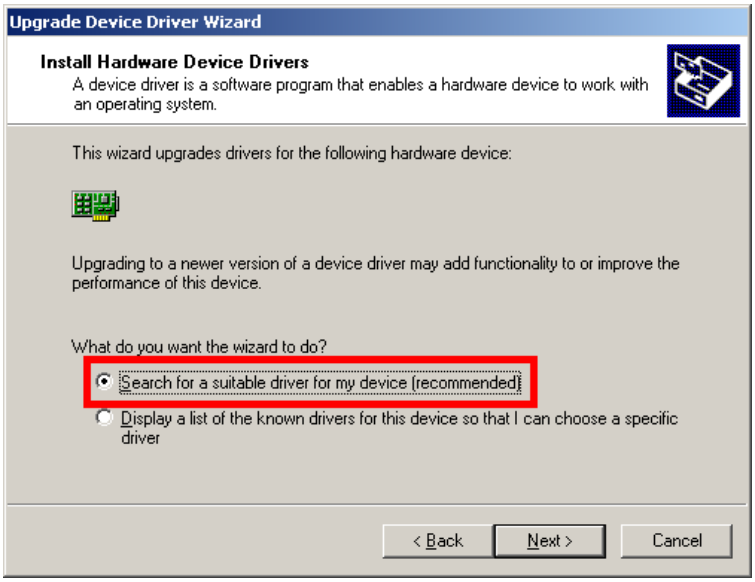
Upgrade Device Driver Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard upgrades drivers for the following hardware device:
Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

**Figure 7-21: Search for Suitable Driver**

**Step 7:** Select "**Search for a suitable driver for my device (recommended)**," and click **NEXT** to continue.

**Step 8:** Select "**Specify a Location**" in the **Locate Driver Files** window (Figure 7-22).

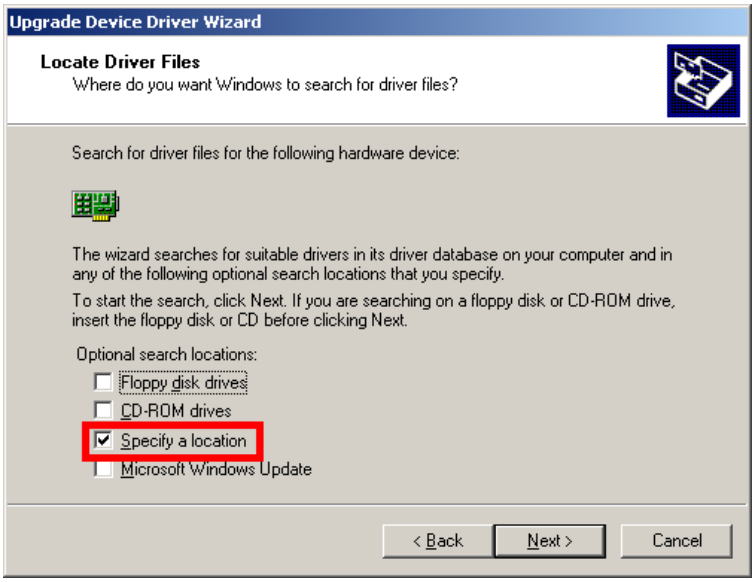
Upgrade Device Driver Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

**Figure 7-22: Locate Driver Files**

**Step 9:** Click **NEXT** to continue.

**Step 10:** The **Locate File** window appears (Figure 7-23).

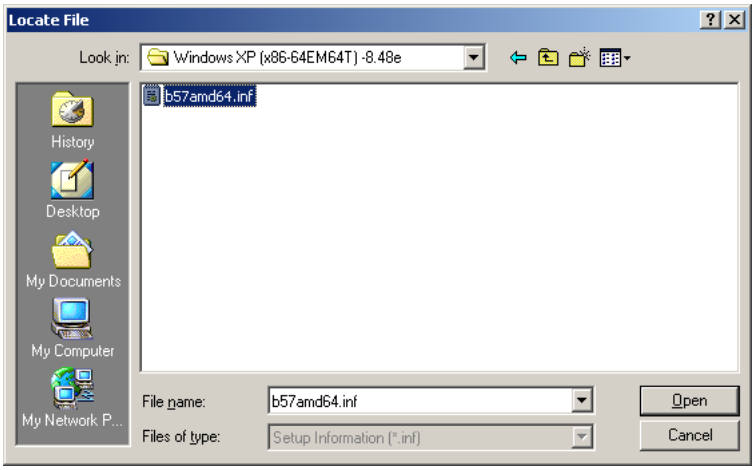


**Figure 7-23: Location Browsing Window**


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**Step 11:** Select the proper OS folder under the "**X:\3-LAN\BROADCOM BCM57xx Drivers**" directory in the **Locate File** window, where "**X:\"** is the system CD drive.

**Step 12:** Click **OPEN** and the driver is installed.

## 7.6 Realtek AC`97 Audio Driver (ALC665) Installation

To install the Realtek AC `97 audio driver, please follow the steps below.

### 7.6.1 BIOS Setup

**Step 1:** Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.

**Step 2:** Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [AC`97].

**Step 3:** Press **F10** to save the changes and exit the BIOS setup. The system reboots.

### 7.6.2 Driver Installation

To install the audio driver please follow the steps below.

**Step 1:** Select **AUDIO** from the list in Figure 7-3.

**Step 2:** A new window opens (Figure 7-24).

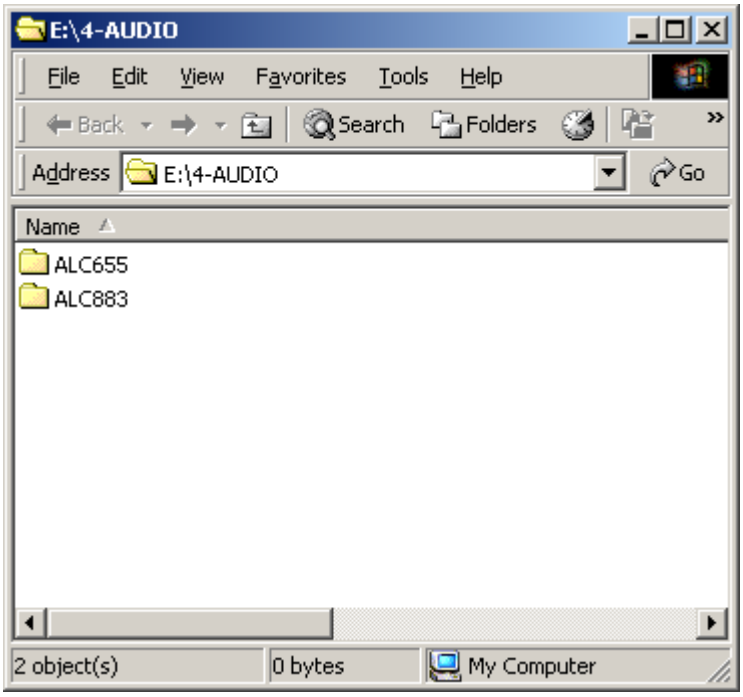


**Figure 7-24: Select the Audio CODEC**

**Step 3:** Double-click the ALC665 folder.


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**Step 4:** Double-click the **Setup.exe** program icon in Figure 7-25.

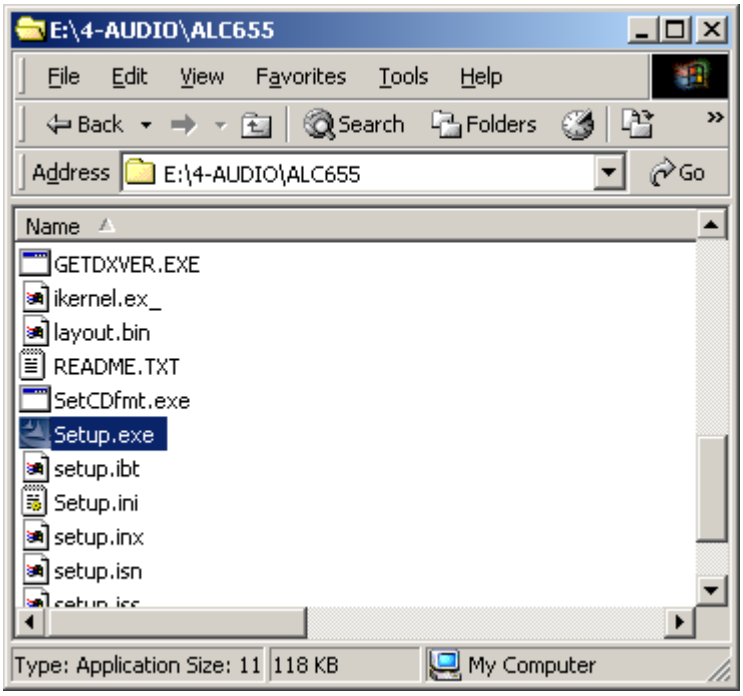


**Figure 7-25: Locate the Setup Program Icon**

**Step 5:** The **InstallShield Wizard** is prepared to guide the user through the rest of the process (Figure 7-26).

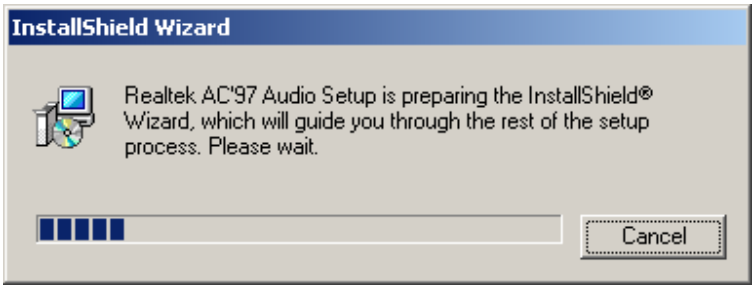
InstallShield Wizard
Realtek AC'97 Audio Setup is preparing the InstallShield® Wizard, which will guide you through the rest of the setup process. Please wait.
Cancel

**Figure 7-26: Preparing Setup Screen**

**Step 6:** Once initialized, the **InstallShield Wizard** welcome screen appears (Figure 7-27).

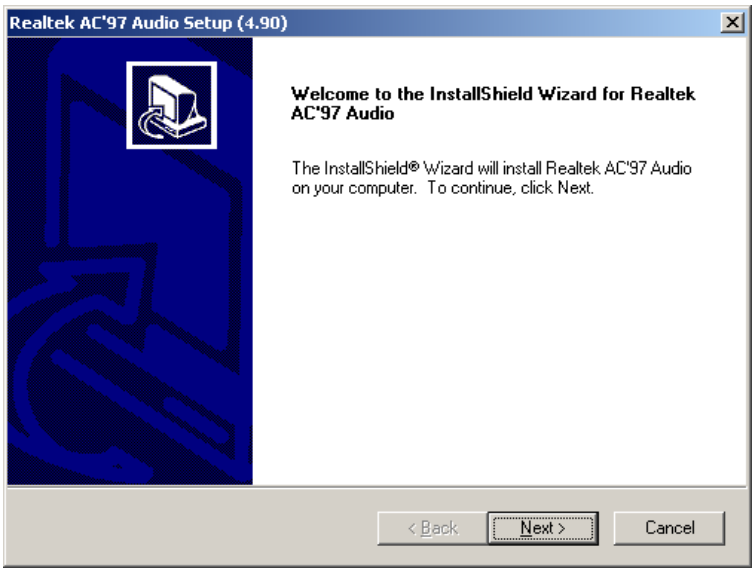
Realtek AC'97 Audio Setup (4.90)
Welcome to the InstallShield Wizard for Realtek AC'97 Audio
The InstallShield® Wizard will install Realtek AC'97 Audio on your computer. To continue, click Next.
< Back
Next >
Cancel

**Figure 7-27: InstallShield Wizard Welcome Screen**

**Step 7:** Click **NEXT** to continue the installation.


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**Step 8:** InstallShield starts to install the new software as shown in Figure 7-28.

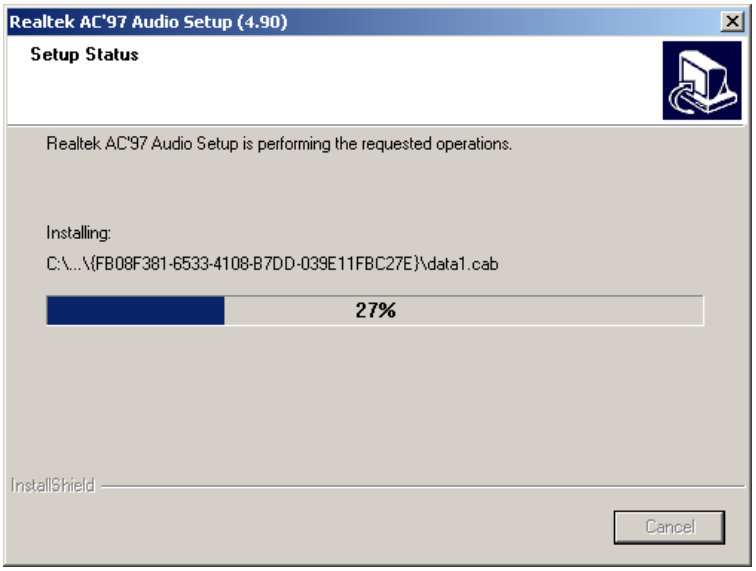


**Figure 7-28: Audio Driver Software Configuration**

**Step 9:** At this stage the **Digital Signal Not Found** screen shown in Figure 7-29 appears.

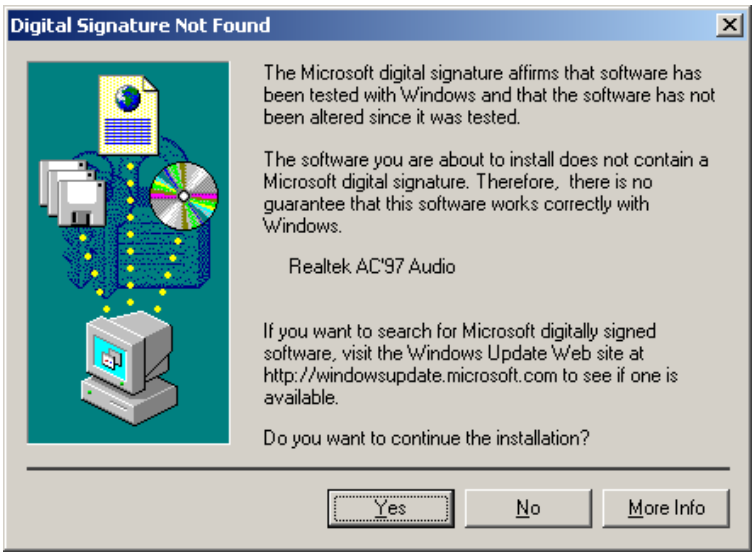
Digital Signature Not Found
The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested.
The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.
Realtek AC'97 Audio
If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.
Do you want to continue the installation?
Yes
No
More Info

**Figure 7-29: Audio Driver Digital Signal**

**Step 10:** Click **YES** and the driver installation begins (Figure 7-30**)**.

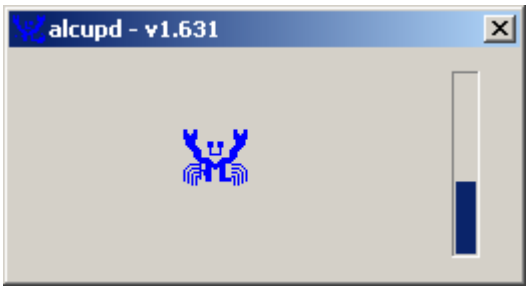


**Figure 7-30: Audio Driver Installation**

**Step 11:** After the driver installation process is complete, a confirmation screen appears (Figure 7-31).

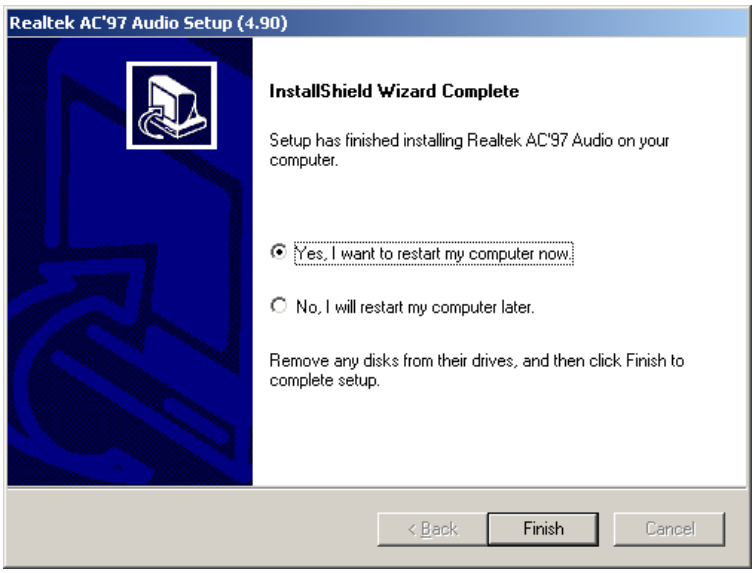
Realtek AC'97 Audio Setup (4.90)
InstallShield Wizard Complete
Setup has finished installing Realtek AC'97 Audio on your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

**Figure 7-31: Restart the Computer**

**Step 12:** The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

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## 7.7 IDE Controller Installation

To install the IDE controller, please follow the steps below.

**Step 1:** Open **Windows Control Panel** (Figure 7-32).

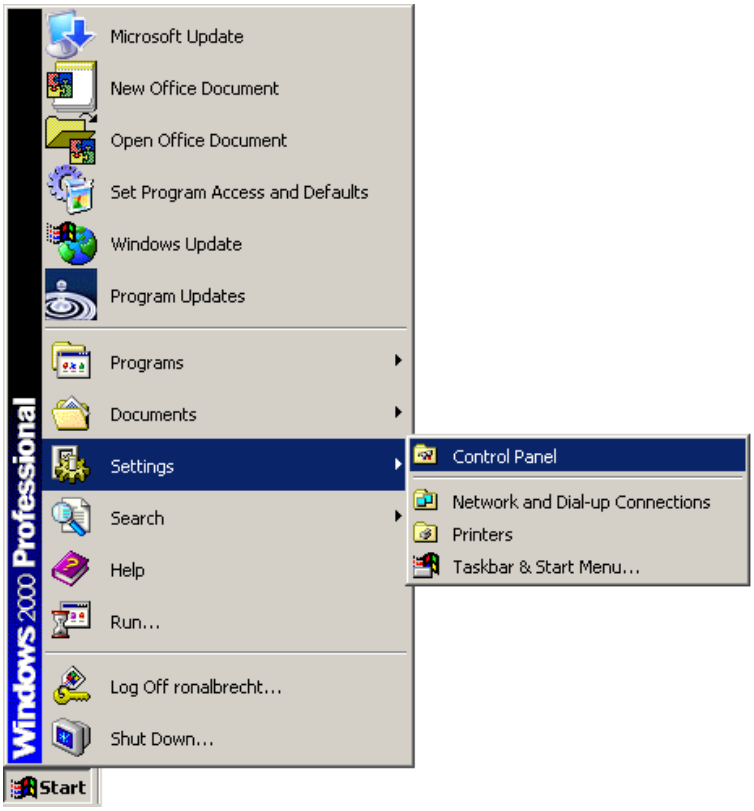


**Figure 7-32: Access Windows Control Panel**

**Step 2:** Double-click the **System** icon (Figure 7-33).

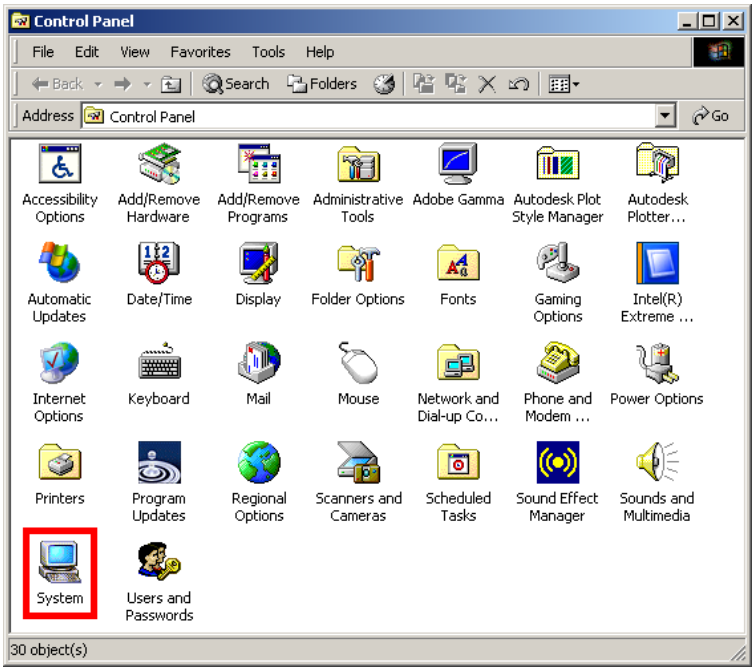


**Figure 7-33: Double Click the System Icon**


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**Step 3:** Click the **Device Manager** tab (Figure 7-34).

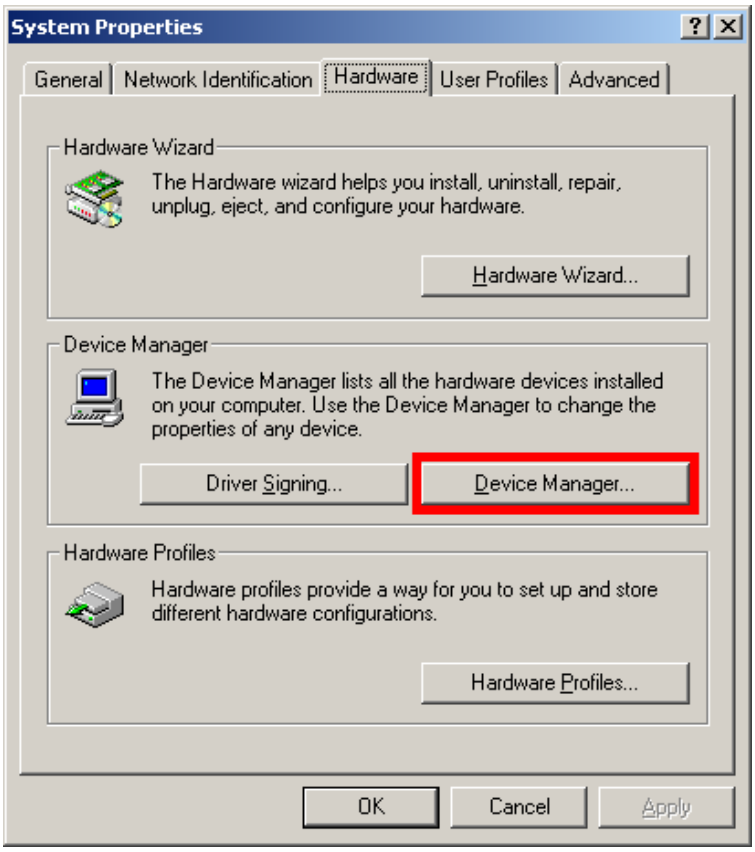
System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

**Figure 7-34: Double Click the Device Manager Tab**

**Step 4:** A list of system hardware devices appears (Figure 7-35).

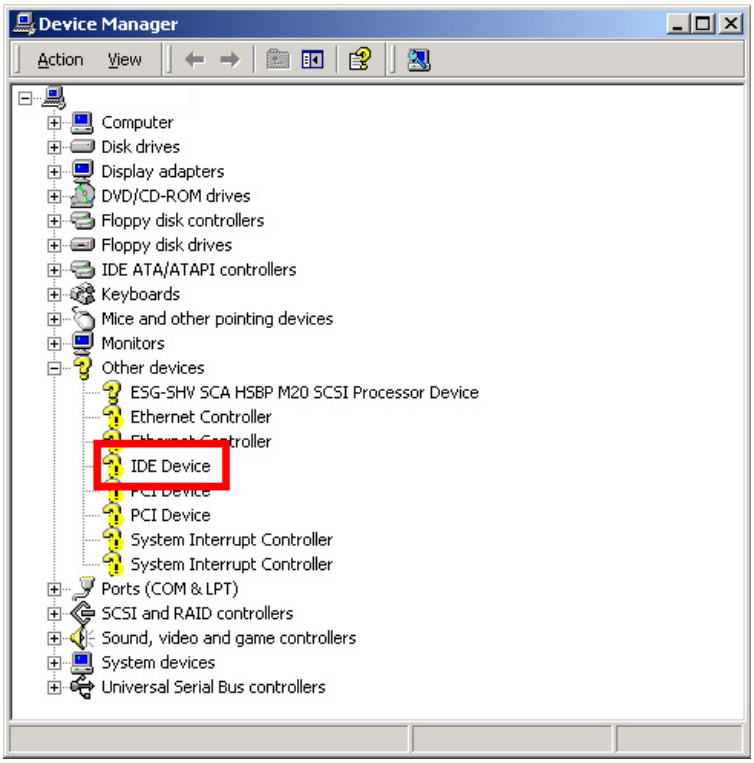


**Figure 7-35: Device Manager List**

**Step 5:** Double-click the listed device that has question marks next to it (This means Windows does not recognize the device).

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**Step 6:** The **Device Driver Wizard** appears (Figure 7-36).

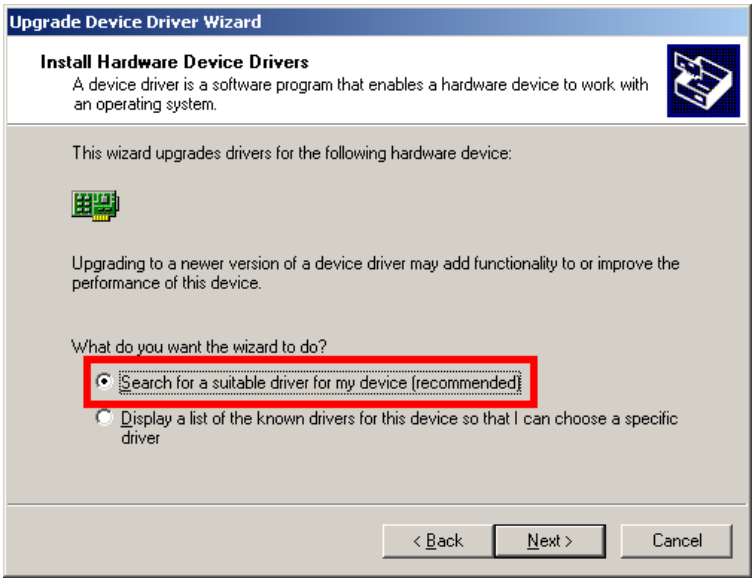
Upgrade Device Driver Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard upgrades drivers for the following hardware device:
Upgrading to a newer version of a device driver may add functionality to or improve the performance of this device.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

**Figure 7-36: Search for Suitable Driver**

**Step 7:** Select "**Search for a suitable driver for my device (recommended)**," and click **NEXT** to continue.

**Step 8:** The **Locate Driver Files** window (Figure 7-37) appears.

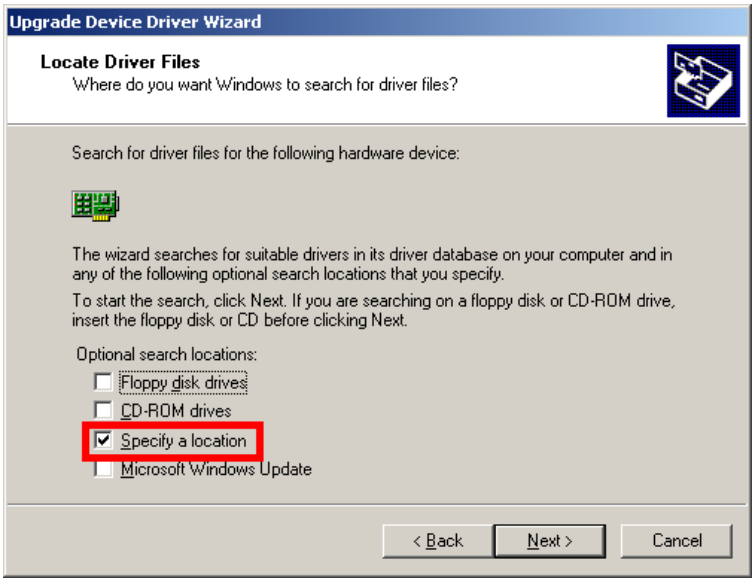
Upgrade Device Driver Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

**Figure 7-37: Locate Driver Files**

**Step 9:** Select "**Specify a Location**" and click **NEXT** to continue.

**Step 10:** Select the proper OS folder under the "**X:\7-IDE\IT8211 v1.3.2.8**" directory ( Figure 7-38) in the location browsing window, where "**X:\"** is the system CD drive.

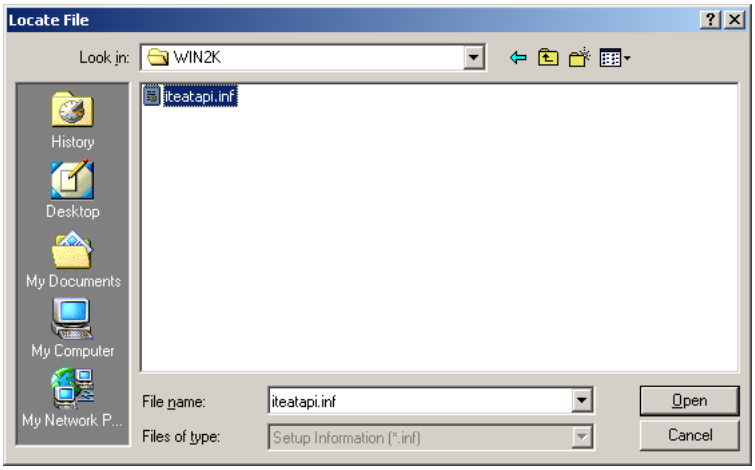


**Figure 7-38: Location Browsing Window**

**Step 11:** Select the **iteatapi.inf** file, click **OPEN** and the driver is installed.


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Appendix

A

# BIOS Menu Options

## A.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 6**.


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- ➔ **PIO Mode [Auto] ..... 118**
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Appendix

B

# Watchdog Timer

**NOTE**:

The following discussion applies to DOS environment. Contact CyberResearch support or visit the CyberResearch website for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

**INT 15H:**

| **AH – 6FH Sub-function:** | |
|---|---|
| AL – 2: | Sets the Watchdog Timer's period. |
| BL: | Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup). |

**Table B-1: AH-6FH Sub-function**

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.


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**NOTE:**

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

## Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H
;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H
;
; EXIT ;
```

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Appendix

C

# Address Mapping

## C.1 IO Address Map

| I/O address Range | Description |
|---|---|
| 000-01F | DMA Controller |
| 020-021 | Interrupt Controller |
| 040-043 | System time |
| 060-06F | Keyboard Controller |
| 070-07F | System CMOS/Real time Clock |
| 080-09F | DMA Controller |
| 0A0-0A1 | Interrupt Controller |
| 0C0-0DF | DMA Controller |
| 0F0-0FF | Numeric data processor |
| 1F0-1F7 | Primary IDE Channel |
| 2F8-2FF | Serial Port 2 (COM2) |
| 378-37F | Parallel Printer Port 1 (LPT1) |
| 3B0-3BB | SiS661CX Graphics Controller |
| 3C0-3DF | SiS661CX Graphics Controller |
| 3F6-3F6 | Primary IDE Channel |
| 3F7-3F7 | Standard floppy disk controller |
| 3F8-3FF | Serial Port 1 (COM1) |

**Table C-1: IO Address Map**

## C.2 1st MB Memory Address Map

| Memory address | Description |
|---|---|
| 00000-9FFFF | System memory |
| A0000-BFFFF | VGA buffer |
| F0000-FFFFF | System BIOS |
| 1000000- | Extend BIOS |

**Table C-2: 1st MB Memory Address Map**


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## C.3 IRQ Mapping Table

| IRQ0 | System Timer | IRQ8 | RTC clock |
|---|---|---|---|
| IRQ1 | Keyboard | IRQ9 | ACPI |
| IRQ2 | Available | IRQ10 | LAN |
| IRQ3 | COM2 | IRQ11 | LAN/USB2.0/SATA |
| IRQ4 | COM1 | IRQ12 | PS/2 mouse |
| IRQ5 | SMBus Controller | IRQ13 | FPU |
| IRQ6 | FDC | IRQ14 | Primary IDE |
| IRQ7 | Available | IRQ15 | Secondary IDE |

**Table C-3: IRQ Mapping Table**

## C.4 DMA Channel Assignments

| Channel | Function |
|---|---|
| 0 | Available |
| 1 | Available |
| 2 | Floppy disk (8-bit transfer) |
| 3 | Available |
| 4 | Cascade for DMA controller 1 |
| 5 | Available |
| 6 | Available |
| 7 | Available |

**Table C-4: IRQ Mapping Table**

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Appendix

D

# External AC'97 Audio CODEC

# D.1 Introduction

The motherboard comes with an onboard Realtek ALC655 CODEC. The ALC655 is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio CODEC that provides three pairs of stereo outputs with 5-bit volume control, a mono output, and multiple stereo and mono inputs, along with flexible mixing, gain, and mute functions.

## D.1.1 Accessing the AC'97 CODEC

The CODEC is accessed through the phone jacks on the rear panel of the motherboard. The phone jacks include:

- LINE IN
- LINE OUT
- MIC IN

## D.1.2 Driver Installation

The driver installation has been described in **Section 7.6**.

After rebooting, the sound effect configuration utility appears in the **Windows Control Panel** (**Figure D-1**). If the peripheral speakers are properly connected, sound effects should be heard.

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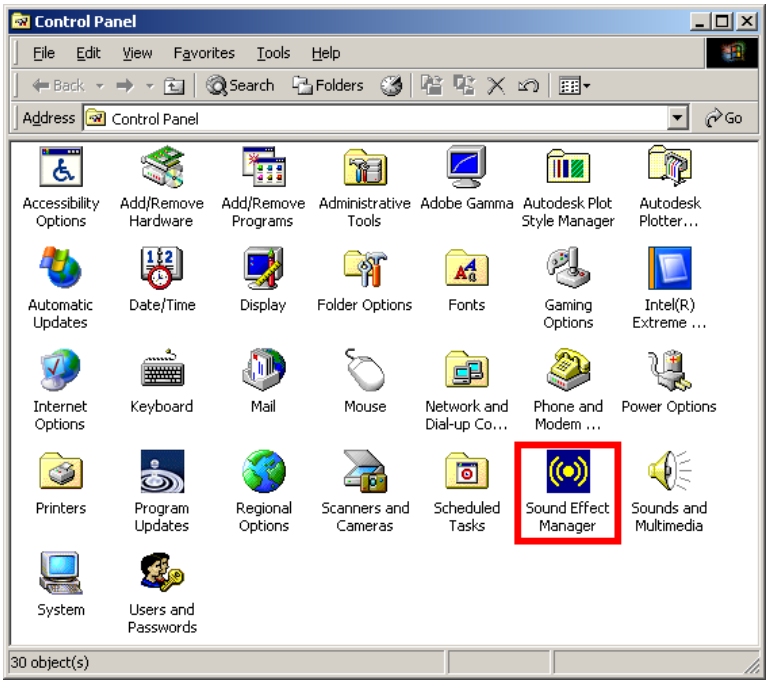


**Figure D-1: Control Panel Sound Effect Manager**

# D.2 Sound Effect Configuration

## D.2.1 Accessing the Sound Effects Manager

Follow the steps below to access the **Sound Effect Manager**.

**Step 1:** Install the ALC655 audio CODEC driver (see **Section 7.6**).

**Step 2:** Click the **Sound Effect Manager** icon in the system task bar (**Figure D-2**).

**Figure D-2: Sound Effect Manager Icon [Task Bar]**

**Step 3:** The sound effect manager appears (Figure D-3).

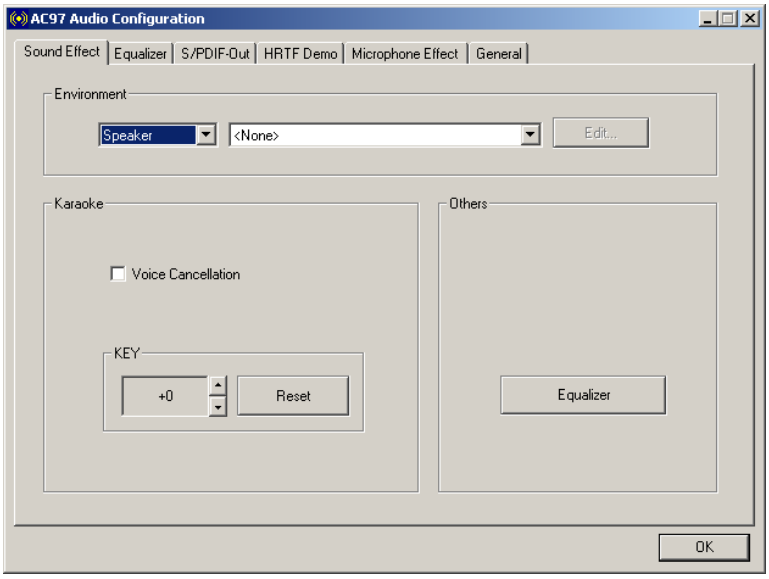


**Figure D-3: Sound Effects Manager (ALC655)**

**NOTE**:

The Sound Effect Manager shown in Figure D-3 is for the RealTek ALC655 audio CODEC. Different CODECs may have different sound manager appearances.

The following section describes the different configuration options in the Sound Effect Manager.

## D.2.2 Sound Effect Manager Configuration Options

The **Sound Effects Manager** enables configuration of the items listed below. To configure these items click the corresponding menu tab in the **Sound Effects Manager** (**Figure D-3)**.

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**NOTE**:

The Karaoke Mode is configured in the Sound Effect menu. To access Karaoke configuration settings, click on the Sound Effect menu tab.

- Sound Effect
- Karaoke Mode
- Equalizer
- Speaker Configuration
- Speaker Test
- S/PDIF-In
- S/PDIF-Out
- Connector Sensing
- HRTF Demo
- Microphone Effect
- General

**NOTE**:

Not all RealTek Sound Effect Managers have all the above listed options. The Sound Effect Manager loaded onto the system may only have some of the options listed above.

Below is a brief description of the available configuration options in the **Sound Effects Manager**.

- ***Sound Effect*** - Select a sound effect from the 23 listed options in the drop down menu. Selected sound effect properties can be edited. Click **EDIT** to edit the sound effect.
- ***Karaoke Mode*** - **Karaoke Mode** is accessed in the Sound Effect tab. The **Voice Cancellation** disables the vocal part of the music being played. The

**Key adjustment** up or down arrow icons enable users to define a key that fits a certain vocal range.

- ***Equalizer Selection*** - Preset equalizer settings enable easy audio range settings. Ten frequency bands can be configured.
- ***Speaker Configuration*** - Multi-channel speaker settings are configured in this menu. Configurable options include:
  - Headphone
  - Channel mode for stereo speaker output
  - Channel mode for 4 speaker output
  - Channel mode for 5.1 speaker output
  - Synchronize the phonejack switch with speakers settings
- ***Speaker Test*** - Each speaker connected to the system is tested individually to see if the 4-channel or 6-channel audio operates properly.
- ***S/PDIF-In & S/PDIF-Out*** - S/PDIF is used to transmit digital and analog audio signals with either a 48 or 44.1kHz sample rate.
- ***HRTF Demo*** - Adjust HRTF (Head Related Transfer Functions) 3D positional audio before running 3D applications.
- ***Microphone Effect*** - Microphone noise suppression is enabled in this menu.
- ***General*** - General information about the installed AC'97 audio configuration utility is listed here.

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# Product Service

## Diagnosis and Debug

CyberResearch, Inc. maintains technical support lines staffed by experienced Applications Engineers and Technicians. There is no charge to call and we will return your call promptly if it is received while our lines are busy. Most problems encountered with data acquisition products can be solved over the phone. Signal connections and programming are the two most common sources of difficulty. CyberResearch support personnel can help you solve these problems, especially if you are prepared for the call.

To ensure your call's overall success and expediency:

1) Have the phone close to the PC so you can conveniently and quickly take action that the Applications Engineer might suggest.
2) Be prepared to open your PC, remove boards, report back-switch or jumper settings, and possibly change settings before reinstalling the modules.
3) Have a volt meter handy to take measurements of the signals you are trying to measure as well as the signals on the board, module, or power supply.
4) Isolate problem areas that are not working as you expected.
5) Have the source code to the program you are having trouble with available so that preceding and prerequisite modes can be referenced and discussed.
6) Have the manual at hand. Also have the product's utility disks and any other relevant disks nearby so programs and version numbers can be checked.

Preparation will facilitate the diagnosis procedure, save you time, and avoid repeated calls. Here are a few preliminary actions you can take before you call which may solve some of the more common problems:

1) Check the PC-bus power and any power supply signals.
2) Check the voltage level of the signal between SIGNAL HIGH and SIGNAL LOW, or SIGNAL+ and SIGNAL– . It CANNOT exceed the full scale range of the board.
3) Check the other boards in your PC or modules on the network for address and interrupt conflicts.
4) Refer to the example programs as a baseline for comparing code.

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***Packages returned without an RMA number will be refused!***

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**• Thank You •**

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